AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. XL NEW YORK—THURSDAY, JANUARY 30, 1919—CHICAGO No. 5

Chicago Dealers' Show Has National Aspect

Regarded as Weather Vane of Future Business—Nothing New from Engineering Standpoint

CHICAGO, Jan. 25—Chicago's nineteenth annual automobile show opened to-day with the same crowds, the same attendance of dealers and manufacturers' representatives, and the same general business aspect as in previous years, although this time it is a dealers' and not a national show. Manager Sam Miles, who has conducted all of the previous national motor car shows, is again in charge of the exhibit, and both in the conduct of the affair and in the attitude of manufacturers toward the show it is as much a national affair as ever.

Manufacturers and dealers unanimously look upon this show as the opportunity to again break into normal business activity. Makers of accessories, as well as cars, are here to get business in order that their plants, which are now released from war work, can start production. This show is regarded as the weather vane of business. It will be a dominant factor in determining the manufacturers' sales policies during the coming year. It is regarded as the one opportunity to repair the shattered sales organizations which exist in many instances, due to the claims of war upon the dealers' personnel.

It is not a show of surprises in the form of new models, advanced designs, and altered equipment. Every manufacturer at the show knew exactly what was to be exhibited by his commercial competitors before the doors opened. In this respect the show differs from previous years. In other respects the general aspect is the same, except that there is a more intense interest in the lining up of new dealers by concerns which were not able to produce at all, or only to a very modified extent during the European war.

Exhibitors at Chicago

Type	Coliseum	Armory	Total
Touring	85	31	116
Roadster	16	1	17
Limousine	7	4	11
Sedan	30	10	40
Coupé	17	3	20
Sport Roadster	4	2	6
Berline	1	1	2
Coupelette	2	..	2
Sport Touring	3	4	7
Town Cars	5	1	6
Suburban Brougham	1	..	1
2-4 Roadsters	3	..	3
4 Roadsters	3	2	5
Total			236
Electric	..	9	9
Cutaway engines	2	..	2
Operating chassis	3	..	3
Stripped chassis	7	4	11
Engines	2	2	4
Wire wheel equipped	50	26	76
Disk wheel equipped	4	..	4
4-cylinders	38	13	51
6-cylinders	128	36	164
8-cylinders	16	16	32
12-cylinders	9	..	9
Total			256

From this general view of the Coliseum some idea may be gained of the elaborate nature of the purple and gold decorations of Chicago's nineteenth annual automobile show

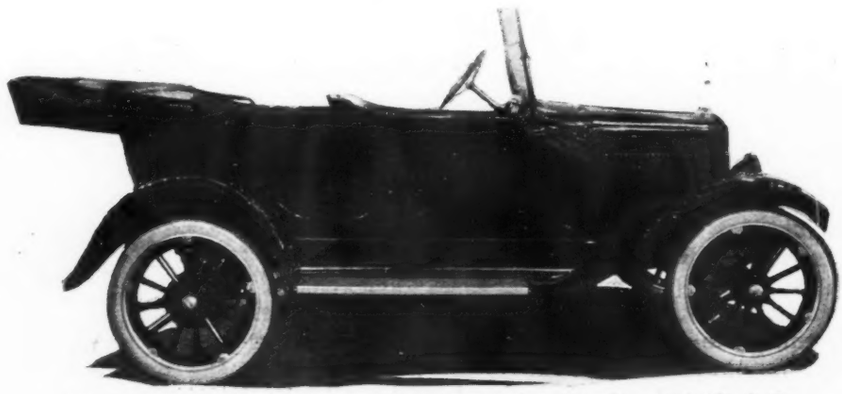
A noticeable feature is the absence of bad weather this year. Chicago is having the same mild winter as the East, with clear skies and a temperature more suggestive of late March than mid-January. The result is that there has been no freight tie-up and all exhibits were on the floor and uncovered when the doors swung open at 2.30, and admitted the crowd which waited. This year the number of exhibitors of cars is 68, and of accessories 135. Last year there were 79 car exhibitors and 146 exhibitors of accessories.

Preponderance of Touring Cars

There was a much greater preponderance of touring cars than would be expected at this season. The total number of touring cars on the floors of both the Coliseum and Armory numbered 116. This is interesting in comparison with the 40 sedans and 20 coupes. The total number of cars at the show was 236 gasoline cars and 9 electrics.

The overlapping of the show dates in New York and Chicago cut down the number of stripped chassis, cutaway engines, and other mechanical exhibits to a large extent, as manufacturers have been in the habit of shipping these from New York to Chicago so that one exhibit would do for both shows. There are only six engines exhibited, two of which are cutaway. The number of stripped chassis is eleven, whereas generally there are two or three times this number. There are three chassis operating so as to show the functions of the parts. Paige has its sawn-in-two chassis which was on the floor last year. The Studebaker gold chassis is replaced this year by one in nickel finish.

It is estimated that the crowd which attended the show on the opening day was 30,000. Dealers have already started to arrive from out-of-town points and it is pre-



The new small Overland was exhibited for the first time with the body mounted on the chassis

The Armory, too, which held part of the Chicago show, was decorated in harmony with the general plan, hangings and embellishments being in purple and gold throughout

dicted by most of the exhibitors that the attendance of out-of-town dealers would be heaviest on Thursday and Friday. Quite a number of the dealers are planning to attend both shows for the purpose of combining a business and pleasure trip to New York and to look over the lines thoroughly.

There is more color apparent at this exhibition than in previous years. The cars are brighter in hue, and this is not due to an increase in the number of strictly show jobs on the floor, but, on the contrary, due to an increase in the number of stock models painted in other colors than black. To be exact, there are twenty-seven black cars out of a total of eighty-five. The next popular color is green, which is represented by fourteen cars, the shades of green being so different, however, that they can be classed as cars of different colors.

The use of colors other than black is appreciated by dealers as well as by the show visitors. This is evidenced by the fact that it was commented on probably more than any other feature of the show by the exhibitors. The air of individuality given to the cars by these color differences, and carried out further by a greater variety of body line than two years ago, gives a much wider range of choice in selection.

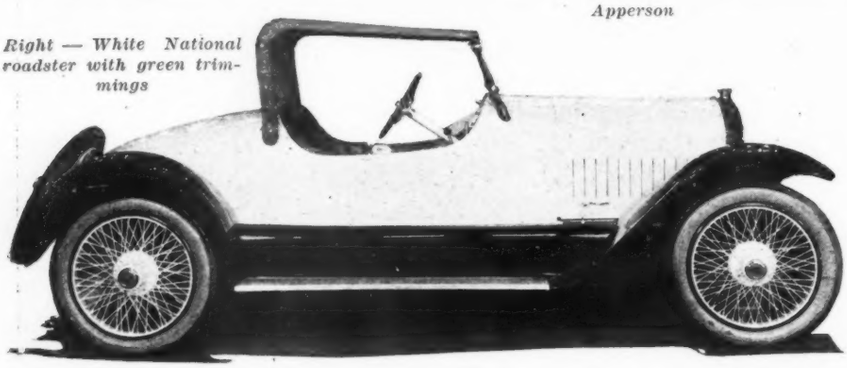
The Essex made its first appearance at any show, and because of its newness attracted a lot of attention

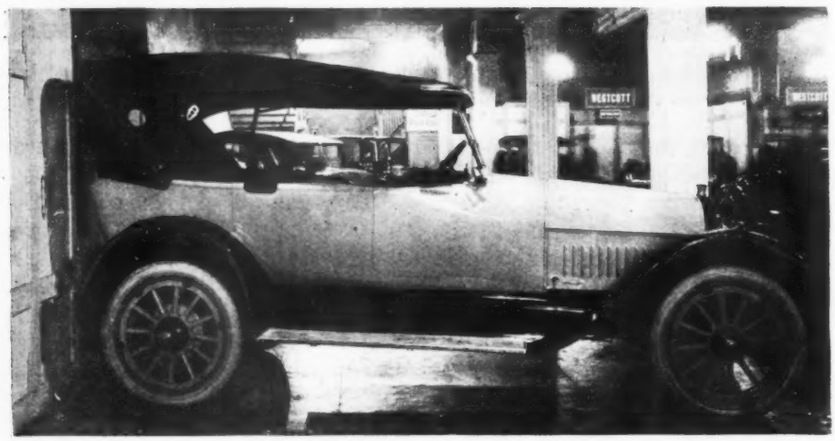
Essex Attracts Attention

From an engineering standpoint there is nothing new at the show. The main attractions from the standpoint of novelty were the first showing of the Ford closed cars equipped with electric starters, the exhibition of the new small Overland in both chassis and complete form, and the showing of the new Essex car, which while previously announced is just getting into manufacture and is furthermore a newcomer at the shows.

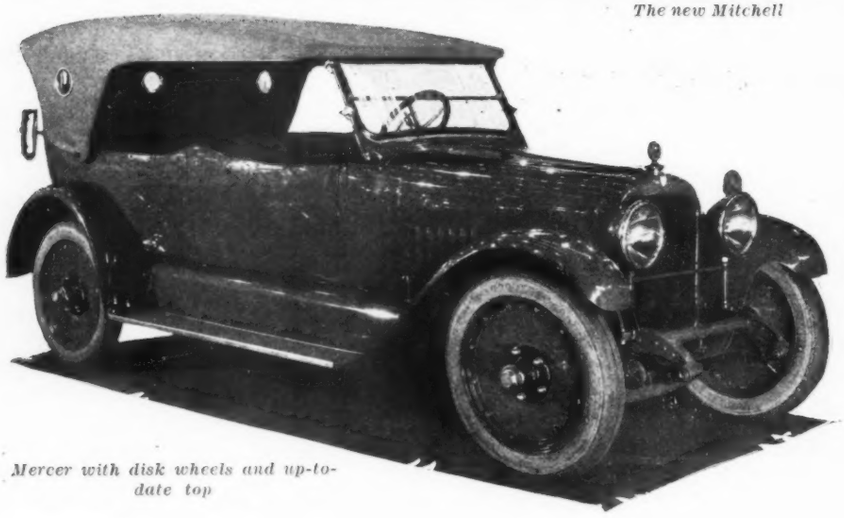
Apperson

Right — White National roadster with green trimmings





The new Mitchell



Mercer with disk wheels and up-to-date top

Concerns which exhibited cars last year that were not yet in production and which were not able to get into production on account of Government restrictions have all taken advantage of the interval to thoroughly test out their cars and eliminate minor imperfections. The result of this is a variety of minor refinements, none of which indicate any marked trends of an engineering nature.

Bevel Edges Increase

In body lines the great increase of bevel-edged jobs is noticeable and there are also a large number of four-passenger cars on the floor which stand out in marked attractiveness, due to the graceful lines made possible by the absence of the deep wheel housings in the sides of the body. The double-cowl type of body is still popular and is represented by a number of makes, but the rear cowl is more subdued than in previous examples of the type.

As an exhibition the present show has all the glamour of its predecessors. The same elaborate decorations and lighting effects are carried out in the Coliseum and Armory as in the past. The decorations are on the same gigantic scale as usual, but a softer color tone is utilized. The main canvas, which forms the ceiling, is decorated with scroll effects of purple and gold; it measures 300 by 240 feet.

About the Decorations

At the ends smaller curtains extend from the ceiling to the lower edge of the balcony, also carrying out the scroll effect. At either end of the Coliseum there is a transparency, that at the south end representing the Goddess of Peace receiving industry, and at the north end Peace presenting the motor car to the world. The upper side shows various types of motor cars in outline. There are thirty-two pillars on the floor of the Coliseum decorated to outline the exhibits, and sixteen in the Armory. The Annex decoration is a Japanese garden effect.

The accessories are mainly on the balcony of the Coliseum, and some are in the balcony in the Armory. The accessory field is in

the same position as the car field as regards new products. Very few of these are to be found at the present time, but there are indications of many improvements to come. Wheeler & Schebler are showing their new line of carbureters for the first time, and there are a number of new tools and garage accessories in the booths along the balcony.

Some Striking Bodies

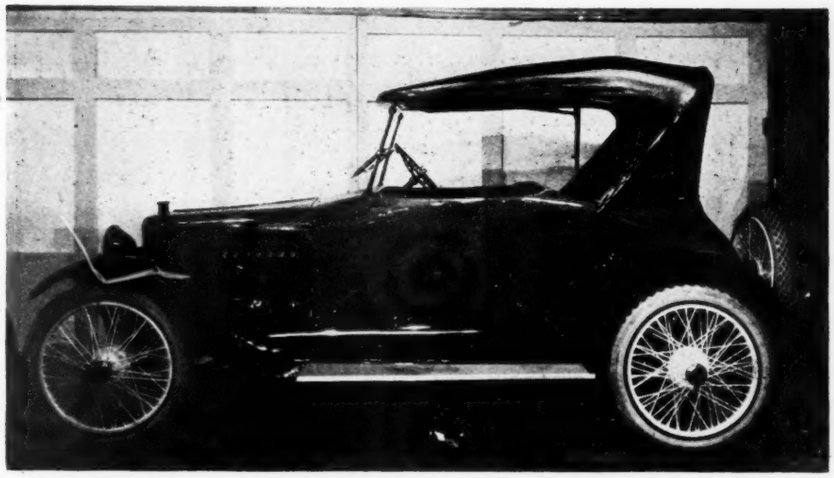
There are some striking body designs, made up as special show jobs, which are of interest as pointing the way for probable future standard body development. One of the features of the show as a piece of fine body work is the National white torpedo roadster with green running gear. This has a tan top. Its low lines and the artistic curve of the top give it an appearance of speed and comfort.

Kissel has a yellow roadster on exhibit which also is attracting attention as a good example of sport work. This roadster has an exceptionally low top and low windshield, which give it its distinctive lines. Scripps-Booth is showing a roadster in maroon in which the curve of the body is continued behind the seat, leaving an open storage space between the back of the seat and the curve of the body. The new little Overland touring car carries out the customary Overland lines exactly.

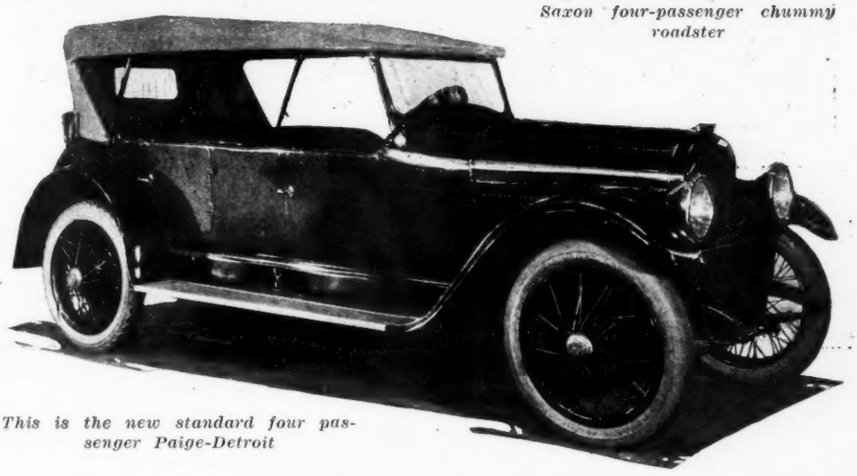
New Four-Passenger Jobs

Among the four-passenger exhibits Paige is showing a car which is put out as a standard body for this year. It is in a shade of blue green with tan upholstery. The car is featured by the long narrow lines only possible with the four-passenger type of design, and has a low, well-cut top which gives it a very striking appearance.

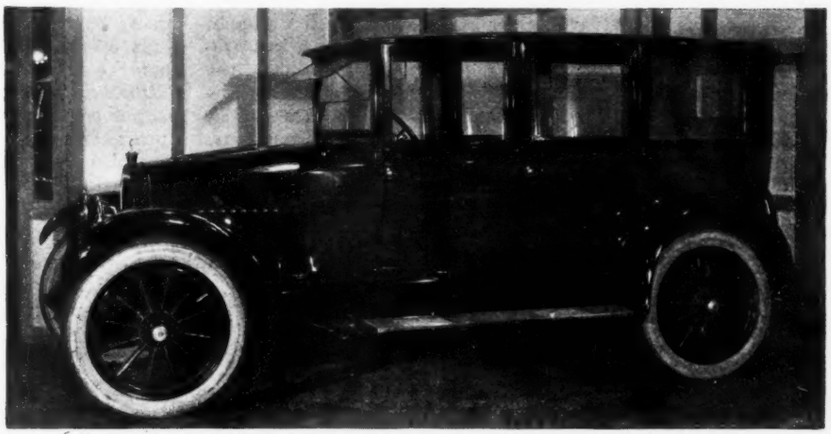
The Holmes car, which made its first appearance at New York last year in an office building near the Palace, is exhibited at the show this year in the Annex. This is an air-cooled car and the particular model on the floor is in a striking shade of blue with a tan front hood, in which the tan painting is brought back in a V shape toward the cowl. Essex also has its cars in the Annex, the exhibit being



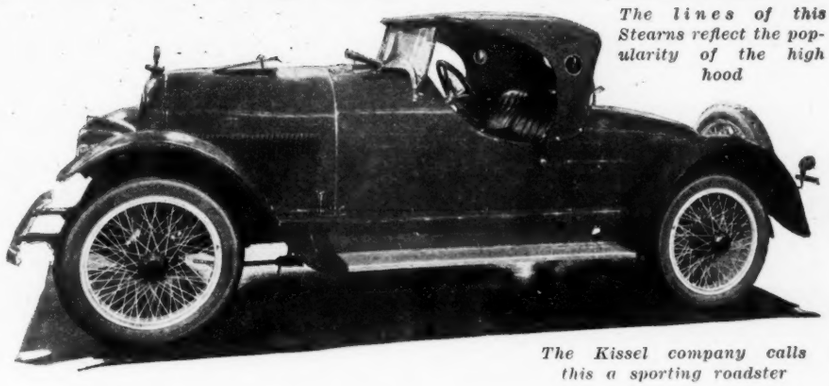
Saxon four-passenger chummy roadster



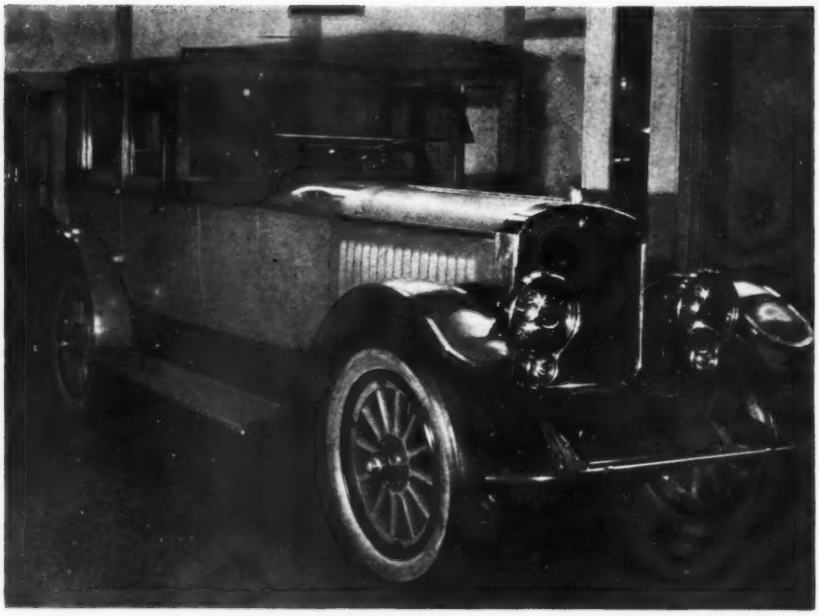
This is the new standard four passenger Paige-Detroit



The lines of this Stearns reflect the popularity of the high hood



The Kissel company calls this a sporting roadster



This Winton limousine was the largest car on view. The radiator cap is practically shoulder high

three standard touring cars in the standard blue green shade. As one of the new exhibits this car is attracting the crowds. Missing from the show this year are the steam cars, there being none of this type to be found.

There are indications that there is going to be greater individuality in body design during the coming year than ever before since the earliest days of car manufacture. Probably as striking an example of sport carwork as can be found anywhere on the floor is the Daniels, which is showing a five-passenger sport design in light blue. This has a double cowl and has steps on the side instead of a runningboard. It is completely outfitted as a sport job, even having a golf bag to match the body carried in a support on the side of the body.

Apperson is showing a good example of top work in which a detachable gypsy curtain is utilized to conceal the top bows. There is an inside as well as an outside flap to the gypsy curtain which conceals the bows, both inside as well as outside of the car. In fact, one of the features of the show throughout is the great improvement in tops; instead of the ugly square, angular rear to be found on tops in the past every one has endeavored to secure a graceful curve which is enhanced by the practically universal employment of plate glass for the rear curtain lights.

Experiments on Flame Propagation

WHEN a mixture of gas and air is ignited within a closed vessel, the flame travels through the mixture in a manner and at a rate which depend upon the nature and the proportion of the gas, the position of the point of ignition, the intensity of the means of ignition, the shape and size of the vessel, and also upon the agitation of the gas mixture. The latter factor is of importance in gas engines where turbulence may be set up during the introduction of the charge. Professor R. V. Wheeler has recently studied these phenomena in mixtures of methane and air at Eskmeals (Transactions of the Chemical Society, November, 1918, pages 840 to 859), with particular reference to the development of pressure and to the speed of the flame propagation. Using spherical vessels (machined bronze castings) of 19.5 cm. and 31.5 cm. diameters and capacities of 4 litres and 16 litres, and mixtures containing from 6 per cent to 13.9 per cent of methane —the lower and upper limits of inflammability are 5.6 per cent and 14.8 per cent of methane—he observed a maximum pressure of 6.97 atms. (above atmospheric pressure), both in the big and small vessels, for the 10 per cent mixture. His values were lower than those of Le Chatelier and Mallard (1883), who obtained irregular values, however, but agreed better with those of Beyling (1902), who experimented with cylindrical vessels of 42 litres and 11 litres capacities. Le Chatelier had also used cylinders of 17 cm. diameter and height, and, like Wheeler, central ignition. In spherical vessels the flame probably travels as a spherical wave; in cylindrical vessels the flame may touch some portions of the cool wall earlier than others. Wheeler found that the flame would, in the latter case, travel upward and downward at the same speed in mixtures containing from 7.5 per cent to 12.5 per cent of CH_4, but would travel faster upward in mixtures outside that range. The maximum pressure observed need not come up to the full theoretical pressure attainable, for apart from radiation and conduction

(*Continued on page* 278)

View of part of the accessory exhibit

Refinement in Detail Principal New Feature at Chicago

Mixture, Temperature and Chassis Lubrication Subjects of Study—Bevel-Edge Bodies Popular, But Often Faulty

By J. Edward Schipper

FROM an engineering standpoint the greatest feature of interest at Chicago is the refinement of detail. No radical departures from previous practice can be found and what there is that is called new has already been discussed and the details previously published. The Essex is on the floor for the first time and the new Overland small four which was shown last year in chassis form now appears with its complete body as well. Ford has the electrically-equipped closed cars on exhibition. Mitchell has a refined car which will be at its showroom early in the week, but which has not made its appearance on the floor of the Coliseum.

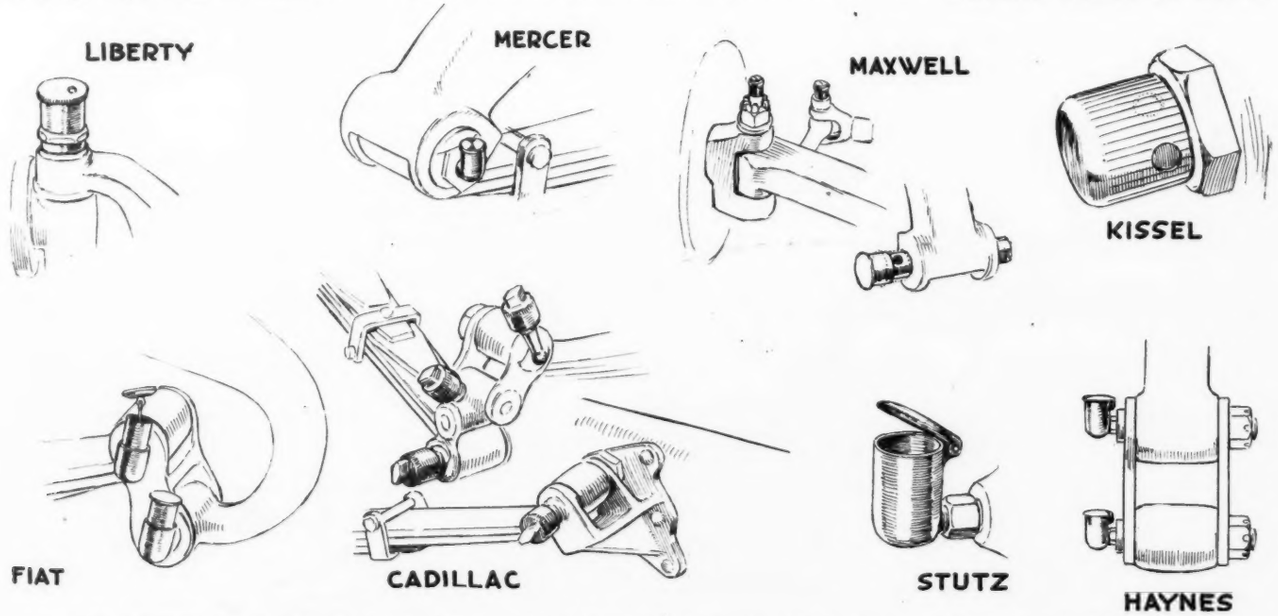
Mitchell's new car is a refinement of its smaller six-cylinder model, bringing it more in line from a production standpoint with the larger car and at the same time considerably improving it. The rear axle is being changed and the same axle as is used for the larger car will now be used for the smaller. This is a Mitchell product and is full floating, replacing the three-quarter floating type previously bought outside. The cone clutch is now being replaced by a Borg & Beck disk, and the tire pump is also being increased in size. A larger bevel-edge body is also fitted.

The electrical system used on the Ford has been made a production proposition and it is freely predicted will soon be standard equipment on all Ford cars. It is manufactured by the Liberty Starter Co., Detroit, and is a two-unit, 6-volt type with the generator mounted on the right side of the engine, taking the drive from the timing gears. The starting motor is mounted on the left side and drives through the flywheel. The car is also fitted with an ammeter mounted on the dash and a Yale switch lock. The rims are now demountable and 30 x 3½-in. tires are used all around. This car sells for $850 f.o.b. Detroit.

Throughout the exhibits there has been a checking over of tire sizes so as to bring these in line with the Government specifications. The use of disk wheels on an increased number of cars is

Color at the Show

Color	Annex	Armory	Total
Black	8	19	27
Maroon	4	5	9
Blue	4	6	10
Green	5	9	14
Khaki	1	2	3
Red	1	5	6
Olive	1	..	1
Gray	1	6	7
White	..	1	1
Tan	..	3	3
Cream	..	2	2
Total			83



The cleaning up of chassis lubrication problems is one of the noticeable features of the various models on view. Here are a few examples showing the use of oil cups to replace grease cups

noticeable, this of course being special equipment. The Disteel wheel is on quite a few of the special show cars.

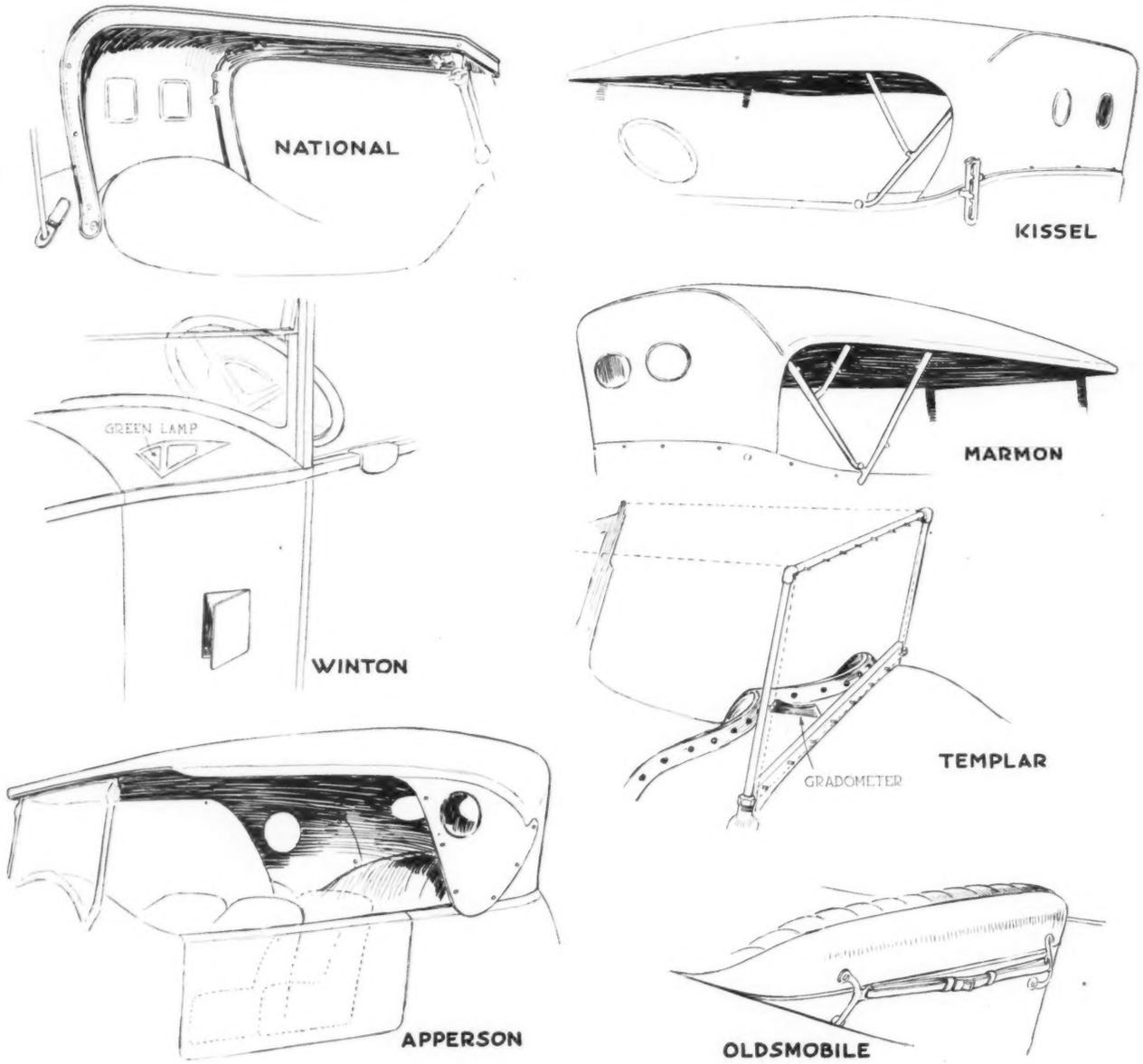
If there is anything of engineering importance to be noted it is the cleaning up of chassis lubrication questions. This does not by any means imply that the inaccessible grease cup has been done away with, because this is not so. It is there in just about as great numbers as at the show last year. There has, however, been an increase in the use of oil cups for spring shackles. The cars on the floor with oil cups on the shackles include Maxwell, Studebaker, the new Overland, Haynes, Oldsmobile, Packard, Nash, Franklin, Briscoe, Mercer, Cole, Kissel, Westcott, Premier, Stutz, Elgin, Liberty, Paterson, and Jordan.

Some of the cars are using self-lubricating bushings at the shackles; these include Holmes, Lexington, Moline, and Marmon. A number of the above cars use oil cups on the steering knuckle pins, although this practice has not become nearly so well represented as the practice of using the oil cups on the shackles.

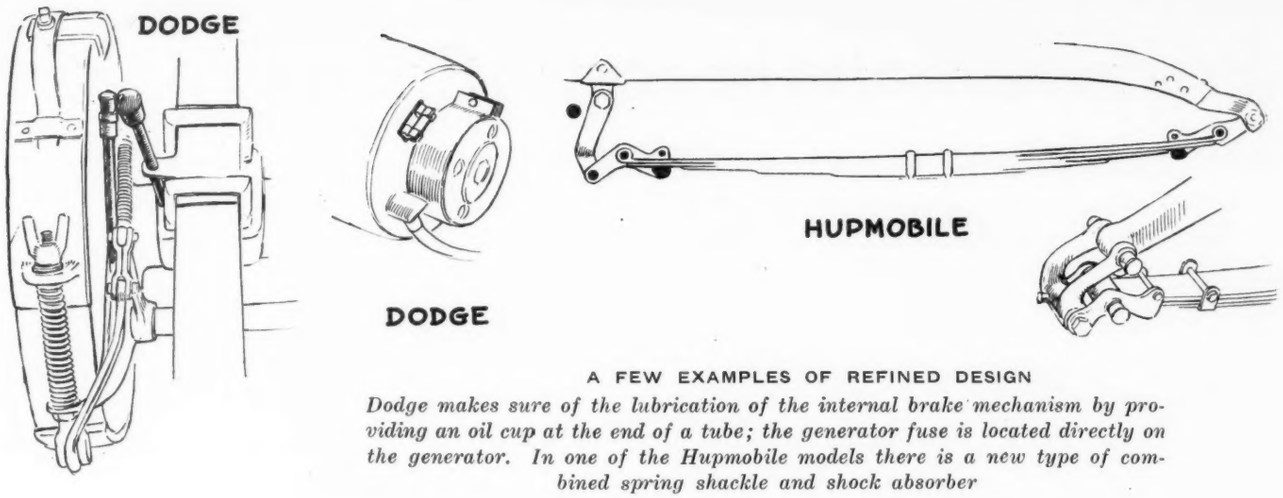
Another feature that is receiving attention is that of the admission of heat to the air intake. Where a lack of foresight may be noticed is in the possibility of controlling the heat. There should be some sort of damper or by-pass which will allow of the admission of air at atmospheric temperature during warm-weather operation. Some of the cars are using a damper which can be adjusted by means of a screwdriver. It would seem that the better way is to follow the practice of others and make the heat control a matter of hand adjustment.

Nash has a linked control by means of which the heat entering the mixing chamber is controlled by the motion of the throttle. At low throttle opening when the heat is required, it is admitted, and at wide-open throttle the heat is shut off from the mixing chamber. The heated air intake, however, is used continuously.

A detail that is growing in popularity with designers



In general, tops appear to be slightly lower, and in many cases gypsy curtains are being made to cover the rear bows. The use of plate-glass windows gives evidence of growing in popularity



A FEW EXAMPLES OF REFINED DESIGN

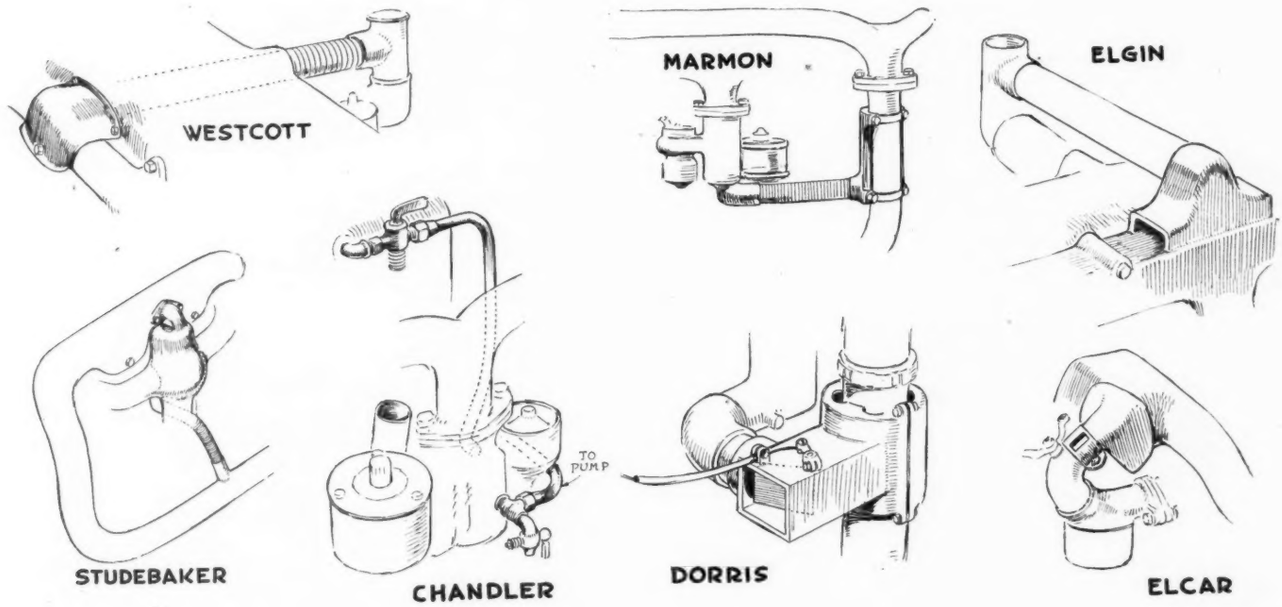
Dodge makes sure of the lubrication of the internal brake mechanism by providing an oil cup at the end of a tube; the generator fuse is located directly on the generator. In one of the Hupmobile models there is a new type of combined spring shackle and shock absorber

is the use of a cross-member at the front extremity of the frame. The cross-member is usually of tubular construction and is not only a stiffening element in the frame itself, but also is of value as a bumper in case of collision. National, Hudson, Mercer and others use this to advantage.

From the standpoint of body design probably the most noticeable feature is the increase of the bevel-edge bodies. From what can be seen at the show it would appear that the use of this type of body should not be attempted by makers who cannot afford to put the best workmanship and materials into the body. In the low-priced body where the material used is of light gage not well reinforced, the bevel edge is hard to keep in a straight line and the result is a very loose-jointed appearing job.

The largest car at the show is a Winton limousine. The chassis is the larger Winton six and the body is by Kimball of Chicago. The size of the car may be judged from the fact that the radiator cap is level with the shoulder of a man of average height. As a rule the makers are going to smaller bodies, and the four passenger type with its narrow lines is making an appeal this year. It is very probable that a six-passenger design carrying out the lines of the four-passenger with the extra seats well upholstered and folding neatly into the backs of the front seats would prove popular. It is surprising that there are no six-passenger jobs shown.

The cars at the show with bevel-edge bodies include all price classes and number among them the following: Studebaker, Hudson, Haynes, Cole, Kissel, Westcott, Lexington, Winton, Scripps, Stearns, Liberty, Essex, Paterson, Jordan, Case and Dorris. In a great many instances these cars are four-passenger design in which the hood is higher than the straight side of the body. Paint colors are in great variety and these four-passenger cars in particular are colored to accentuate their individuality.



SOME EXAMPLES OF HOT-AIR EQUIPMENT

On all these carbureters, except the one used on the Chandler, makers have provided for supplying hot air to the mixture. Chandler prefers the use of a water-jacketed carbureter

Production and Import of Tungsten Ores

A Slight Falling Off as Compared with the Two Preceding Years—Tungsten Important as an Alloy in High Speed Tool and Valve Steels and as a Material for Incandescent Lamp Filaments, Electric Contact Points, Etc.

THE production of tungsten ores in the United States in 1918, according to preliminary statistics collected by Frank L. Hess of the United States Geological Survey, Department of the Interior, was equivalent to 5065 short tons of concentrates, carrying 60 per cent tungsten trioxide, of which 5015 tons, valued at $5,156,500, was marketed or consumed by the producers and 50 tons was reported as left on hand at the mines at the end of the year. Although the output was very large, it was less than that of the 2 previous years—1916, with 5923 tons, valued at $12,075,400, and 1917, with 6144 tons, valued at $6,783,400. The production in 1917 was the largest made by any country, although it was much smaller than the combined output of the countries under British rule.

Colorado regained its lead as the largest producing State, with 1910 tons of ferberite, against California's 1781 tons of scheelite and Nevada's 885 tons of scheelite. In 1917 California had "led by a nose," with 2781 tons, against Colorado's 2707 tons, though in 1916 Colorado had produced 2401 tons to California's 2171 tons. Nevada's output was 689 tons in 1916, 143 tons in 1917, and 885 tons in 1918.

Large Production of Scheelite

One of the remarkable developments of the year was the large production of scheelite in the Great Basin region from the contact-metamorphic deposits, limestones altered by solutions accompanying intrusions of granite. Much the larger part of the ore mined in Nevada; in fact, all reported except that from the Tungsten Dyke mine at Sodaville was taken from contact-metamorphic deposits. The deposits at Bishop, Cal., also furnished a considerable quantity. Altogether the contact-metamorphic deposits gave an ouput of 1413 tons. In the Eugene Mountains, about 7 miles northwest of Mill City, the Nevada Humboldt Tungsten Mining Co. and the Pacific Tungsten Co. erected mills which began work late in the year. A pipe line 22,000 feet long, to bring water from wells in the valley of Humboldt River, two pumping stations to lift the water more than 1100 feet to the mines, and a power line 32½ miles long to bring electricity to them were built by a mutual subsidiary company, the Mill City Development Co. A tramway 3½ miles long, with a gasoline locomotive and steel cars, hauls the ore of the Mill City Mining Co., a closely related concern, to the Pacific Tungsten Co.'s mill. The mines have gasoline hoists that will soon be replaced by electric hoists. Earlier in the year these companies shipped their ore to the mill of the Humboldt County Tungsten Mines & Mills Co. at Toulon, 60 miles southwest of their mines, for treatment. This company also treated ores from its own mines and from a number of other properties.

At Bishop, Cal., the Standard Tungsten Co., which had been working contact-metamorphic deposits, ran out of ore and after re-treating a part of the tailings closed its mill. The Pine Creek Tungsten Co. began active work on the development of a contact-metamorphic deposit about 25 miles northwest of Bishop, at an altitude of about 11,000 feet. The country is very rough and steep, and many miles of road had to be constructed. It is expected that the mill will be put in operation in 1919. The altitude is so high that during a large part of the year snow hampers operations unless they are carried on under cover.

The famous mine of the Atolia Mining Co. at Atolia, Cal., made a much smaller output in 1918 than in 1917 but was still the largest producer in the United States. In the Boulder, Col., field ferberite was taken from the principal mines in quantity comparable with that mined in 1917, but the output from the lesser mines was so much smaller that the total dropped nearly a third. The Wolf Tongue Mining Co. had bonanza ore in its Cold Spring mine and was the largest producer in the district.

In Arizona the production was equivalent to about 213 tons of concentrates carrying 60 per cent tungsten trioxide, valued at $245,000, and it included wolframite, hübnerite and scheelite. The Yucca Tungsten Co. was the largest single producer.

The Homestake Mining Co. produced considerable wolframite from the replacement deposits at Lead, S. D. The production of other tungsten ores in the Black Hills was so small as to be negligible. A small quantity of scheelite was produced in Utah, and a little hübnerite was taken from Blue Grouse Mountain, near Deer Park, Wash.

Prices

The prices of tungsten ores were fairly steady during the greater part of 1918. Scheelite that was free from phosphorus, sulphur and other harmful impurities brought about $25 a unit most of the year. The other minerals brought from $18 to $25. Impure ores were always a matter of bargaining. Toward the end of the summer and in the fall the demand was very heavy, owing to the huge orders of the Government for war materials. With the signing of the armistice on Nov. 11 orders were canceled, the demand slowed down and prices fell accordingly. At the end of the year wolframite of good quality that carried more than 60 per cent of tungsten trioxide was offered in New York for $12 a unit.

Imports

The imports during the year were much the largest ever made; for the first eleven months they amounted to 10,448 short tons, valued at $10,224,668. As nearly as can now be determined, 3581 tons came from South America, 6465 tons from China, Hongkong and Japan; 260 tons from Mexico, and 142 tons from other places, though it may have been transshipped from Asia or South America. The ores credited to China and Hongkong are of course all Chinese, though part of them may come from the British-controlled mainland. The ores credited to Japan are probably also largely Chinese but are shipped by way of Japan by Japanese firms.

The largest Asiatic shipments of the eleven months were those of November. The Chinese deposits are alluvial and are now probably mined more cheaply than any others in the world.

—

Warning Against Waste of Natural Gas

A word of warning is being uttered by C. G. Gilbert, Curator of the Division of Mineral Technology, U. S. National Museum, with regard to wastefulness in the handling and use of natural gas, in a foreword to a technical paper by S. S. Wyer, published by the Bureau of Mines.

Natural gas, says Mr. Gilbert, is the least appreciated, consequently the most abused, of the mineral resources in popular use. The issues involved are of direct concern to some ten millions of the inhabitants of the United States, and their range of influence does not stop even here; for they form a prominent feature in the nation-wide problem of fuel supply which may be solved effectually only through coordinated attention to the component parts.

WANTED—SANE HANDLING

Labor Situation Does Not Warrant Hysterical Outbursts—Condition Only Temporary

INVESTIGATION BY AUTOMOTIVE INDUSTRIES REVEALS FACTS

If All Men Withdrawn from Industry for War Purposes Were Reabsorbed, It Would Still Require About 2% More to Take Care of Probable Productive Necessity for This Year

By Harry Tipper

THE public agitation in connection with the question of the readjustment of labor due to the return to peace conditions continues unabated. There is now before Congress a bill to restrict immigration for a period of 5 years on the plea that there is not sufficient employment for the workers now in this country, and that widespread immigration is likely to occur which may lead to destructive competition in labor circles.

Newspaper articles are appearing from time to time expressing a fear of the growth of Bolshevism and unrest due to increasing unemployment and the difficulties of readjustment.

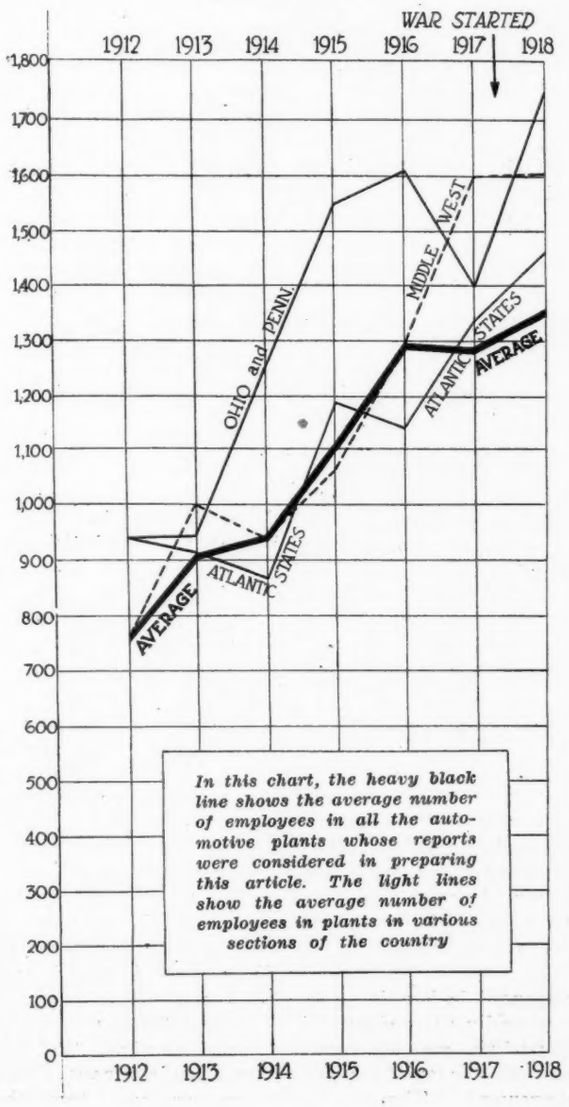
On the other hand authorities who ought to be acquainted with the matter state that there is no surplus of labor in this country, and that the question is one of movement of labor from its present location to spread it out over the surface of the country where it is naturally required for the continuance of peace production.

To some extent all these views have at least a temporary basis in the actual conditions of the moment.

It is true that there is considerable unemployment, particularly in the coast cities in the East and the large manufacturing centers.

It is also true that there is some difficulty in placing the returned soldiers at work as they are demobilized, and it is probable that the labor readjustment will mean sufficient difficulty in various localities to provide a reason for a certain amount of unrest and a certain amount of dissatisfaction with the government.

These, however, are only temporary conditions, and unless they are likely to become permanent they do not justify the hysteria which has been exhibited in the discussions upon the subject; and they do not justify such drastic measures as Congress is proposing in connection with immigration.



Analysis of Condition

During the four years previous to the European war the total number of immigrants into this country amounted to a little over 4,100,000. During the war there have been taken out of industry for war duty something over 4,000,000 men, and there have been introduced into industry not more than 300,000 women.

The immigration during the war amounted to just over 1,000,000, or a shortage of a little over 3,000,000, leaving a matter of 1,500,000 to 2,000,000 who must be returned to industry in this country over and above the normal supply which would have been secured during the same period by the usual process of immigration.

There are in all upwards of 20,000,000 workers in this country of all kinds, and the reports of total unemployment according to the labor organizations whose reports are not likely to be underestimated amounted to 210,000 at the time this article is written, or approximately 10 per cent of the total labor of the country.

On the other hand, the United States Employment Bureau reports that in forty-four states during the week of Jan. 11 there were 153,763 applications for jobs, of which 99,000 were placed, but that during the same week the employment service received 202,757 applications for help, *or nearly* 50,000 *more applications for help than there were applicants for jobs.*

From all the figures which can be secured from all interested sources there is no evidence showing actual surplus of labor in the country in any more important sense than a survey in September, 1914, would have shown in actual surplus.

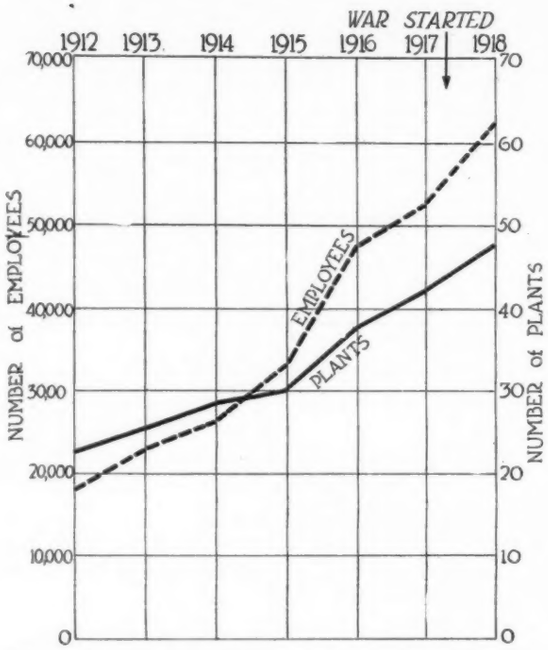


Chart showing the increase in the number of plants and the increase in number of employees during 7 years

The beginning of the European war showed a very pronounced drop in industrial activity for some little time, with a corresponding surplus of labor for a few months. But this surplus was occasioned only by the temporary financial condition and did not indicate more people for the work than were necessary to continue the country's business.

It is evident from the reports which have been received from most of the states that the unemployment is due to four causes:

1—A desire of returning soldiers to engage in new occupations and to settle in new parts of the country. In New York City the Red Cross, the Knights of Columbus, the Y. M. C. A. and the United States Employment Service have all noted the large majority among the demobilized soldiers applying for jobs whose homes are in different cities scattered all over the country, but who do not wish to go home if they can avoid it. In the writer's own little office, out of twelve applicants for work in one week, all of them returned soldiers, only one lived in the vicinity of New York, and a personal examination of the record in a number of offices in this city discloses approximately the same condition.

Cancellation of War Orders Increases Unemployment

2—The shutting down of employment in war industries due to the cancellation of war contracts. This has resulted in the sudden increase of the ranks of the unemployed by thousands of laborers, skilled and unskilled, who have up to this time been making unusually large pay. These workers do not attempt until necessity drives them any other work at a lower rate, and they will not move away from the manufacturing centers except under the same conditions.

3—The dilatoriness of the Government in legalizing in former contracts the red tape surrounding the cancellation of contracts, and the inability of the manufacturer to proceed with production plans with the existing unsettlement of all its financial arrangements. There is no excuse for this governmental waste of time in the settlement of these matters, notwithstanding the desirability of preventing undue profiteering. There was no hesitation in writing off more than $1,000,000,000 of the cost of the merchant marine in order to put it upon a competitive basis, and there seems to be no hesitation about the guaranteed price of food products with the producer of food. The length of time occupied by the present hesitation about production and the severity of the disturbance itself are greatly affected by the action of the Government in connection with these contracts, which are very numerous and which involve billions of dollars.

4—The tendency of all parties concerned, whether the leaders of organized labor or individual manufacturers or politicians, to use its period and its present uncertainty in order to gain an advantage and not unitedly attempt to solve it. There is a great deal of junkerism in all official bodies, and particularly in the bureaucracy which represents them, and there is nothing much to choose between the political junkers who see in a disturbance only the means of pushing their particular theory of politics and the labor junkers who use this disturbance primarily as a means of increasing the power of labor, the industrial junkers who see in it an opportunity to regain control of the labor bargain.

As the third largest industry in the country, the automotive industry is deeply interested in the size of this question, in the means which must be taken to settle it, and in its political significance.

Investigation Made in Automotive Industry

For this reason a survey has been conducted through the industry in the attempt to determine the present condition, the way in which the employment has been effected by the war, and the possibility of reabsorbing rapidly the workers who were taken away for war duty and who may have been involved in the reduction of activity.

From the chart which is shown it will be observed that in the automotive field, out of approximately 125 concerns investigated, the increase in employment required by the growth of the industry calculated on the basis of the average number of employees to a plant per year showed 18 per cent as between 1912 and 1913, 3 per cent as between 1913 and 1914, the drop in this respect being due directly to the reduction in industrial activity at the outbreak of the European war; as between 1914 and 1915 this rose again to 18 per cent. It showed 17 per cent in 1916.

The restrictions imposed upon the industry by our entry into the war are indicated by a decrease of 1 per cent in 1917 over 1916, and the recovery from these conditions is indicated by an increase of 5 per cent between 1917 and 1918.

In the three years of normal activity for which the figures are given, that is, in 1913, 1915 and 1916, the increase is almost exactly the same, varying only 1 per cent in any one year from the other years. It is a little in-

teresting to note that the average number of employees who were drawn from the industry from these same establishments for war purposes is 17 per cent, or almost exactly the yearly increase in employment in a normal year.

If all the men who were withdrawn from the industry for war purposes were reabsorbed into the industry, it would still require about 2 per cent more in order to take care of its probable productive necessities for this year. This, however, must be taken in conjunction with the reductions which have occurred in some of the plants in the last month.

These reductions average about 6 per cent of the total number of employees reported, and they could be taken care of by the necessities for increased forces in a number of the concerns reported.

It is interesting to note that while the automotive industry did a great deal of war work, this was confined to a comparatively small number of concerns. The larger portion of the concerns in this industry were restricted by the war in their activities without receiving any corresponding compensation in the nature of war work. Their mechanics were absorbed into other industries or into the larger plants, and they are now attempting to rebuild their organizations.

Most of the concerns which were on war work report temporary reductions in employment to the extent of from 10 to 30 per cent. Most of the concerns who were not engaged upon war work report a necessity for increasing their working forces anywhere from 5 to 50 per cent.

It is very evident that the process in the automotive field is one of readjustment. Even in the plants which have been engaged on war work the increase in employment has not been very abnormal.

One concern, for example, that has been extensively engaged in work for the Government increased its employees in 1915 over 1914 by 1700. In 1916 it increased over 1915 by 1300. In 1917 it increased over 1916 by 2600, and in 1918 it increased over 1917 by 1600, showing that its increase on account of our entering into the war was less than the increase necessitated by the demand upon us from our Allies.

A number of other facts are brought out by this analysis resulting from the information secured from the actual manufacturers in the automotive field which illuminate the labor situation still further.

In the reports from the East it is interesting to note that all the reports from Buffalo show a surplus of labor. A majority of the reports show a surplus of both skilled and unskilled, while the other reports indicate a scarcity of the unskilled. Syracuse also shows a surplus of both kinds; Rochester a surplus of semi-skilled, by which is evidently indicated machinists that were trained during the war to operate a certain machine in a few weeks' time.

But the small manufacturing towns in the northern part of New York State, such as Binghamton and Jamestown, are still suffering from a scarcity of labor, or at any rate have no surplus.

It will be some time probably before the labor which is unemployed in Buffalo will have spread itself over the smaller manufacturing towns in that area.

The same difference in the situation is to be observed in Pennsylvania and Ohio. Philadelphia, Pittsburgh, Harrisburg, Cleveland and Springfield report considerable surplus, while the smaller towns in the same state are not yet aware of any increase in the applications.

It is obvious from the survey that reductions in employment which have taken place in the automotive field affect only about 25 per cent of the firms reported, while increases affect about 35 per cent.

The number of employees affected by the reductions is slightly larger than the number of employees demanded by the increases, but the demand is not sufficiently great to indicate any real diminution of activity even temporarily, and in most cases it is expected evidently that the reductions which have occurred will only be enforced until about March or April, by which time the operations will have become sufficiently near normal to permit of the organization going ahead on the full complement of men.

It would be of great advantage to the automotive field if the manufacturers who are interested in their organization activities in the localities would institute activities looking to the more rapid transfer of labor from the manufacturing centers to the smaller industrial towns, and from the East, particularly the coast cities, to some of the sections in the interior where there is still a scarcity of labor and no immediate prospects of getting all the labor that is required.

The propaganda which has been established from various sources is unfortunate because it has led to a misconception of the matter, and the problem is conceived to be of far greater proportions than it actually assumes.

Even conceding the estimates of unemployment issued by the labor organizations, the problem is not nearly so severe as it was in 1914, when the beginning of the European war practically stopped industrial activity in this country for several months. *The problem requires sane, common sense handling and not the hysterical outbursts which have been so much in evidence in the newspapers and general publications.*

Extinguishing and Preventing Oil and Gas Fires

DURING the period of 10 years from Jan. 1, 1908, to Jan. 1, 1918, approximately 12,850,000 bbl. of oil and 5,024,506,000 cu. ft. of gas were destroyed by fire in the United States, entailing a total estimated property loss of $25,254,200. During this period 503 fires were reported. Three hundred and ten of these fires were caused by lightning and 193 by all other causes. The losses from the fires caused by lightning were estimated to be $11,148,000, and from those due to all other causes $14,106,200. Directly and indirectly, the fires resulted in the deaths of nearly 150 persons and were responsible for almost as many more being permanently disabled.

For the past three years the Bureau of Mines has been conducting investigations to determine the nature and the specific causes of these fires, with a view to suggesting means whereby they may be successfully combated and, in some places, perhaps eliminated entirely. The results of this investigation are given in Bulletin 170 of the Bureau of Mines, by C. P. Bowie.

As the subject of oil and gas fires is necessarily broad, no attempt is made in the bulletin to treat it exhaustively; rather the bulletin aims to point out what has been done by operators in the past, and to describe various fire-prevention methods and fire-fighting apparatus which are being used or adopted by many of the larger oil companies. These methods and apparatus, it is believed, if universally employed by operators, will largely decrease the present enormous losses.

Wismach American Gage Blocks—Correction

IN the article on the above named blocks in AUTOMOTIVE INDUSTRIES of Dec. 5, the limit of accuracy of these blocks was erroneously stated to be 1/10,000 in. This should have been 1/100,000 in.

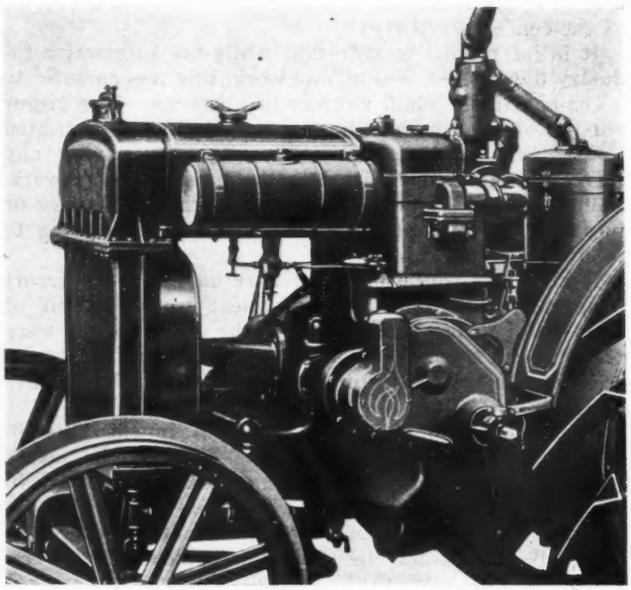
Case 15-27 Hp. Tractor

New Addition to the Case Line Embodies the Same Unit Construction as the 10-18 Hp. Model—Burns Kerosene or Distillate and Is Rated as a 3-4 Plow Tractor

By P. M. Heldt

WHILE the J. I. Case T. M. Co. of Racine, Wis., has long been prominent in the tractor field, and for years has been marketing a complete line of tractors, a little over a year ago it began to redesign its machines on lines in accordance with the latest ideas in the tractor industry. The first model of the new line was the 10-18 hp., a 2-plow machine which was fully described in AUTOMOTIVE INDUSTRIES of April 18, 1918. Recently the company has come out with another model, embodying the same features, known as the 15-27, which is the particular subject of this article. The present line is completed by a third model, rated at 20-36 hp., and capable of pulling 4-5 plows. The latter machine is equipped with a four-cylinder 5½ x 6¾-in. engine. The design of transmission is almost identical with that of the two smaller sized tractors, except that the differential is located on the jack shaft, which is geared to both rear wheels. All the gears on this larger tractor are inclosed and run in oil. This model, however, does not embody the unit construction characteristic of the two smaller models, the engine, transmission and rear axle housing being independent, supported by a frame of channel steel.

The most interesting feature of the Case 15-27 tractor is the main frame, which is a single iron casting so designed that in addition to serving as a frame it also serves as the main part of the transmission case, the crankcase and the rear axle housing. This construction permits all the main bearings of the engine, transmission and axle to be machined in this one casting, which makes it impossible for them to get out of alignment. At the front end of the main frame there is a cast steel extension which is firmly bolted to the main frame. To the center of this extension is pivoted the front axle, thus giving a three-point support to the main frame and allowing the wheels to accommodate themselves to uneven ground surface.

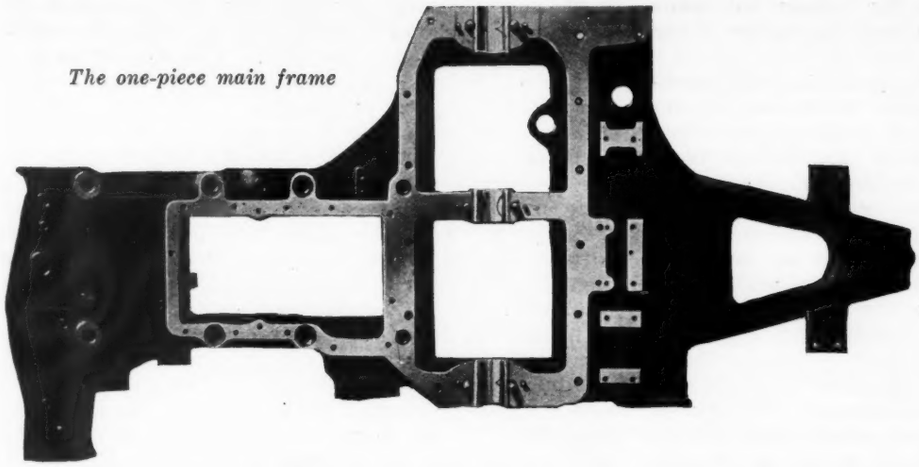


Left side view of forward part

The main frame casting is machined on special milling and boring equipment. The bores for the rear axle bull pinion shaft, first reduction shaft and main engine bearings are bored in one operation. This insures absolute alignment of these parts, which cannot be changed in the process of erecting.

The front axle is of the automobile type, both the axle proper and the steering knuckles being drop forgings. A worm and wheel steering device is used, and the tractor is said to be quite easy to steer. The rear axle is mounted in roller bearings in the axle housing forming part of the main frame casting. Roller bearings are also used throughout the transmission, and are carried in a dustproof case. The tractor can be turned around in a circle of 27 ft. 3 in. outside diameter. The drawbar is so connected to the tractor as to bring

Case 15-27 hp. tractor—right side view

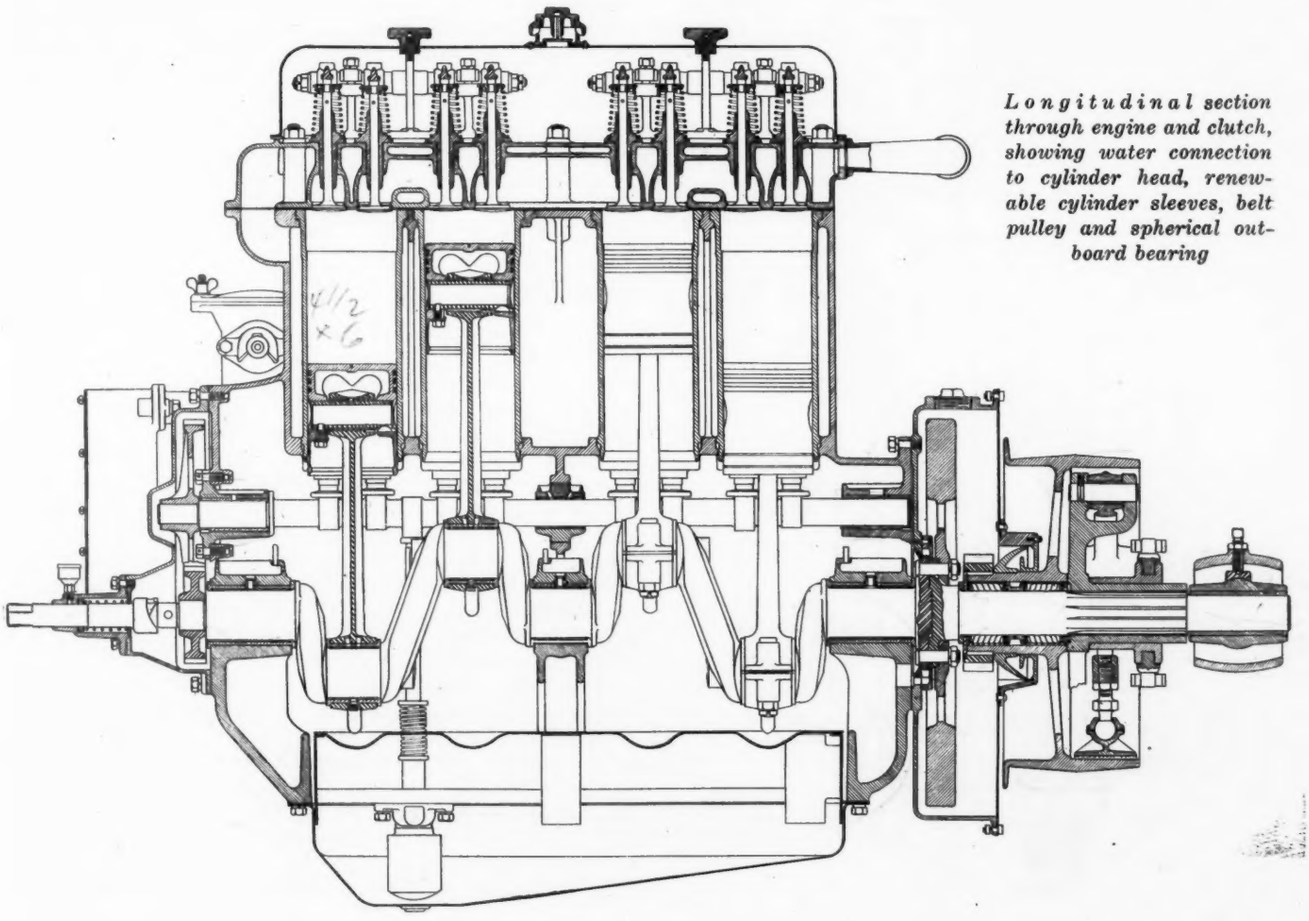


The one-piece main frame

the pull under the rear axle, and the load pulled has no effect upon the steering of the tractor. The drawbar is made heavy so that it may be able to stand the strain of backing up a load, and it may be left swinging or locked in any position desired.

The 27-hp. engine is a special tractor engine, designed to stand the heavy strain common in tractor work, and, like the engines of the other models, is claimed to be capable of developing more than its rated power. The engine is designed to burn kerosene, and all of its parts are easily accessible. It is of the four-cylinder, vertical type, with a bore of 4½ in. and a stroke of 6 in. In order that the transmission may be entirely through spur gears, and that the belt pulley may be mounted on an extension of the engine crankshaft, the engine is mounted transversely on the frame.

The entire valve mechanism, including the rocker arms, springs, stems and rods, is inclosed in a dustproof case, and lubricated by oil spray from the crankcase. In case the operator should wish to inspect the parts, it is an easy matter to remove the cover over the mechanism. The cylinder block is made with removable barrels or liners, which in case of wear or accident can be easily replaced with new ones. This feature is considered to be a most important one in a tractor engine. The sleeves are made of close-grained iron and their bores are ground to a smooth finish. The cylinder head is a separate casting and affords ready access to the valve and cylinders. All parts which require effective cooling, such as the spark-plug bosses, valve seats and valve-stem guides, are surrounded by water. The top of the cylinder head is inclosed with a stamped steel cover. This cover is provided with a felt gasket where it rests on the cylinder head. On top of this cover is placed a breather valve which allows the motor crankcase to vent past the operating parts of the valve gear, so as to keep them well lubricated. This breather valve is so constructed that it is closed when



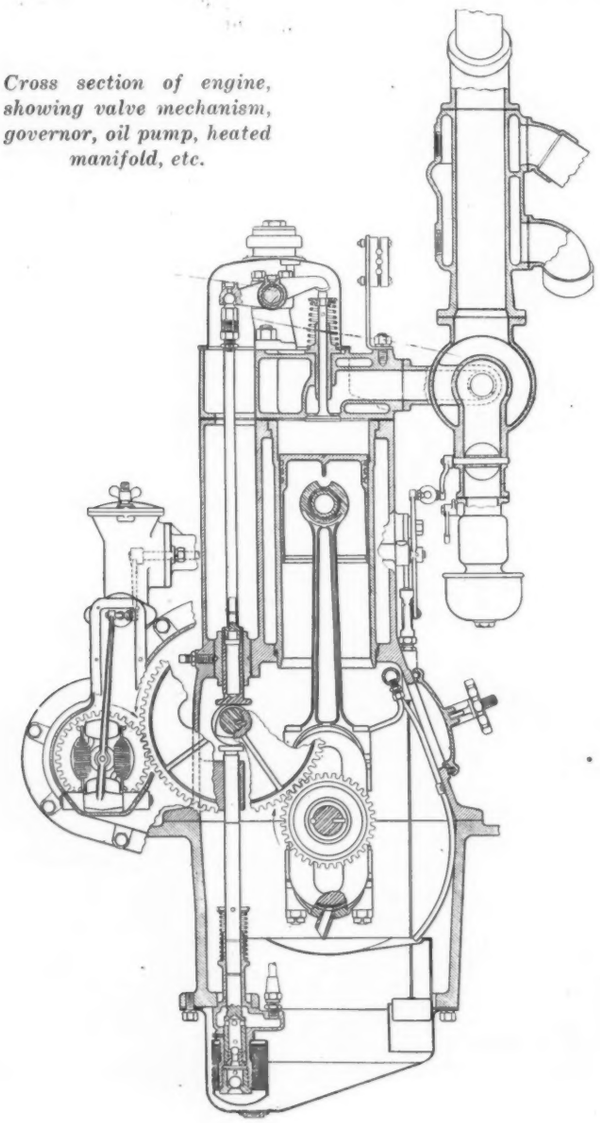
Longitudinal section through engine and clutch, showing water connection to cylinder head, renewable cylinder sleeves, belt pulley and spherical outboard bearing

subjected to any pressure from the outside, but opens to allow the pressure to escape from the inside of the crankcase.

As already pointed out, the lower half of the crankcase is a part of the main frame. This gives the engine a solid bed on the frame and makes it impossible for it to get out of alignment with the other parts of the tractor. The crankshaft main bearings are carried by the main frame castings, with bearing caps on top. There are two large hand holes in the upper half of the crankcase through which the caps of the main bearings can be easily removed, or adjustment to the bearings be made. There are three main bearings, which are of the bronze-back, babbitt-lined type, and their total length is 12⅛ in.

Adjustment of the crankpin or main bearings can be made after the removal of the oil pan. The design is such that the piston with its rod can be removed past the crankshaft, and these parts, of course, can also be taken out through the upper end of the cylinder when the cylinder head is removed.

The crankshaft is a steel drop forging, heat treated. Its bearings are accurately ground to size, and are of the substantial dimensions demanded in tractor work. All main and crankpin bearings are 2½ in. in diameter.



Cross section of engine, showing valve mechanism, governor, oil pump, heated manifold, etc.

Of the main bearings the two outer ones are each 4½ in. long and the central one is 3⅛ in., while the crankpin bearings are 2¾ in. long. The connecting-rods are drop forgings of I-beam section, heat treated. The upper end is provided with a solid bronze bushing, in which the piston pin is carried. The latter has a diameter of 1⅜ in. and its bearing length is 2¾ in. The bushing in the upper end of the connecting-rod is made of Non-Gran bronze.

The pistons are made of the same grade of cast iron as the cylinders, and cut with grooves for three piston rings at the upper end, and with oil grooves at the lower end.

Throughout the entire design care has been taken to see that such parts as require adjustment can be readily reached and parts that are subjected to wear, such as valve-stem guides, push-rod guides and camshaft bearings, are provided with bushings which are easily replaced at little expense. Care has also been taken to see that the engine parts can be taken out and replaced readily.

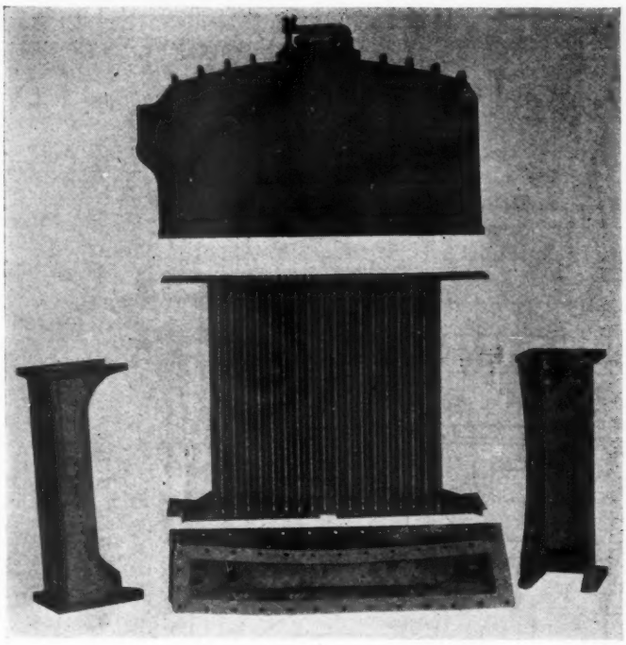
Combination Lubricating System

The engine is lubricated by a combination force feed and splash system. Pistons, connecting-rods, bearings, and valve rocker arms are lubricated by splash, while the crankshaft bearings, camshaft and governor are oiled by force feed from a pump. This pump is of the plunger type and located at the lowest point of the oil pan. The suction side of the pump is provided with a large screen and the whole pump assembly can be easily taken out for inspection. This pump delivers oil to a manifold which is located inside of the crankcase and from this manifold separate pipes carry oil to each main bearing and to each splash trough under the crankpins. A separate pipe from this manifold supplies oil to lubricate the camshaft gears and governor. An oil indicator in plain sight of the operator shows when the pump is working, while a float, also directly in view of the operator, shows the height of the oil level in the reservoir. This reservoir is made of No. 16 U. S. gage sheet steel, spot welded. The oil pump is of the plunger type, with a cast brass body and a cold-rolled steel plunger which is hardened and ground.

Fuel System Details

Either kerosene, distillate, or gasoline can be used as the fuel. The fuel is fed by gravity through a 1⅜-in. Kingston carbureter, where it is mixed with air which has previously been passed through an air washer, and then passes through a heated manifold to the engine cylinders. The air washer is of the Case company's own design. In it the air is forced through water and screens which take out all particles of sand and dirt. This feature has a very important bearing on the life of the engine, as no dust can get inside the cylinders, it is claimed. The engine is governor-controlled, the governed speed being 900 r.p.m. The governor is of the centrifugal ball type, and is driven from the camshaft by helical, cut-steel gears. It is inclosed and runs in oil. A small cover can be easily removed and gives access to the governor. Ignition is effected by means of a dust-proof high-tension magneto equipped with an impulse starter. No batteries are required for starting. The magneto is accessibly located and easy to remove and replace, while the timer and distributor are so located that they can be conveniently examined.

A centrifugal pump circulates the cooling water



Parts of the Case radiator

through the cylinder jackets and radiators. The latter is of the tube and fin type, with cast-iron frame. A gear-driven fan is mounted behind the radiator, and is provided with a friction safety hub, designed to relieve the fan of undue strain when the engine accelerates very quickly. The fan shaft runs on New Departure ball bearings. The cooling water is kept at the proper temperature for successfully burning kerosene by means of a Sylphon thermostat which is inserted in the cooling system.

One of the accompanying drawings illustrates particularly the accessories drive. It will be seen that ball bearings are used for mounting the shaft driving the pump, fan and magneto. Oldham couplings are so placed that the pump or fan drive can be removed as a single unit.

The clutch is of the expanding type. Its spider is provided with a splined hub, and the shoes are faced with asbestos friction fabric. As will be seen from the right-hand view of the tractor, the clutch is very conveniently located for adjustment. It is inside the belt pulley and is operated by means of a lever from the operator's seat. A single clutch serves for both traction and belt work. The clutch pulley is also provided with a brake which is operated by the clutch lever. This brake is used to hold the pulley from spinning when the gears are being changed, and when the gears are in mesh it can be used as a brake for the tractor.

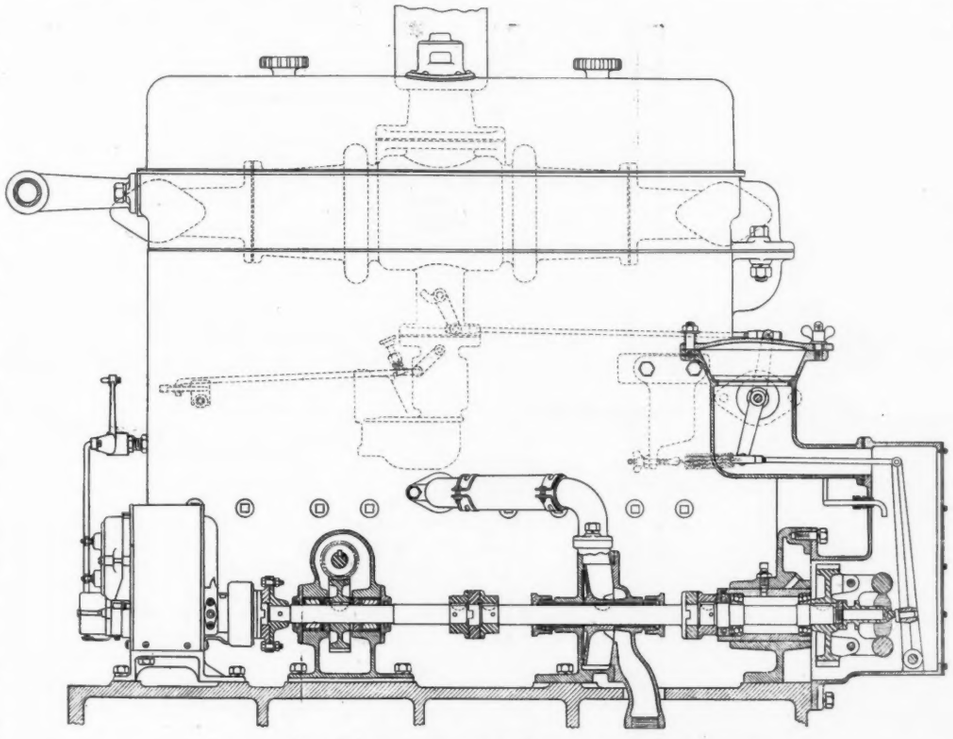
Location of the belt pulley is ideal for belt work, the pulley being mounted on an extension of the crank. The belt pulley is supported not only by the engine main bearing, but also by an outboard bearing. This construction takes considerable load away from the main engine bearing when the tractor is used either in the belt or in the transmission. It should be noted that the clutch arm is fastened to the shaft by means of splines and that the belt pulley is mounted on Hyatt roller bearings.

Design of Transmission

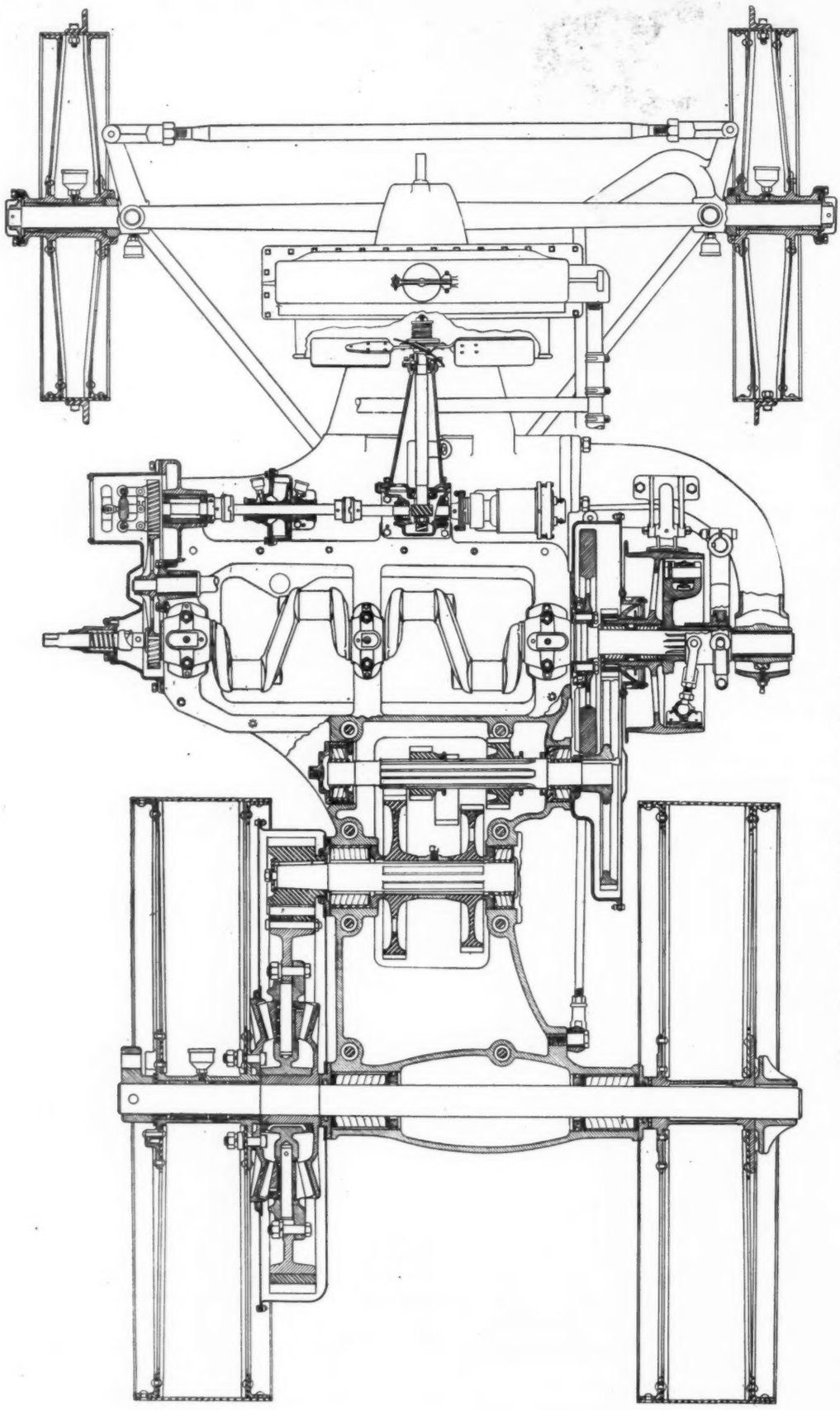
Only cut-steel spur gears are used in the transmission of the Case tractor, and these are inclosed in a dust-proof case and run in oil. The bearings are contained in the frame castings, making it impossible for them to get out of alignment. By removing the cover all of the transmission gears can be easily reached. The gear ratio from the engine to the bull wheel is 62 to 1 for the low gear and 40 to 1 for the high gear.

The crankshaft pinion is made of a steel forging and meshes with a semi-steel first reduction gear, keyed to the first shaft in the transmission. This shaft runs in Hyatt roller bearings and is provided with six splines through which the two-speed changing gears are driven. These sliding gears are drop forged, cut and hardened, and they provide two forward speeds, 2½ m.p.h. for plowing and 3½ m.p.h. for road work and for some of the lighter work in the field.

The low and high-speed gears are both made from drop forgings, are cut and hardened. The shaft which carries these gears also carries the bull pinion, and runs in Hyatt roller bearings. The bull pinion and master gear are steel forgings. Both of these have cut teeth, and run in oil in a dust-proof case. The differential bevel gears and bull pinions are made from cast steel, and they are inclosed to protect them from dust



Accessories, drive shaft, magneto, pump and governor



Plan view of Case 17-25 tractor, showing layout of transmission and drive

and provide for easy lubrication. The differential is carried on the rear axle and runs in Hyatt roller bearings.

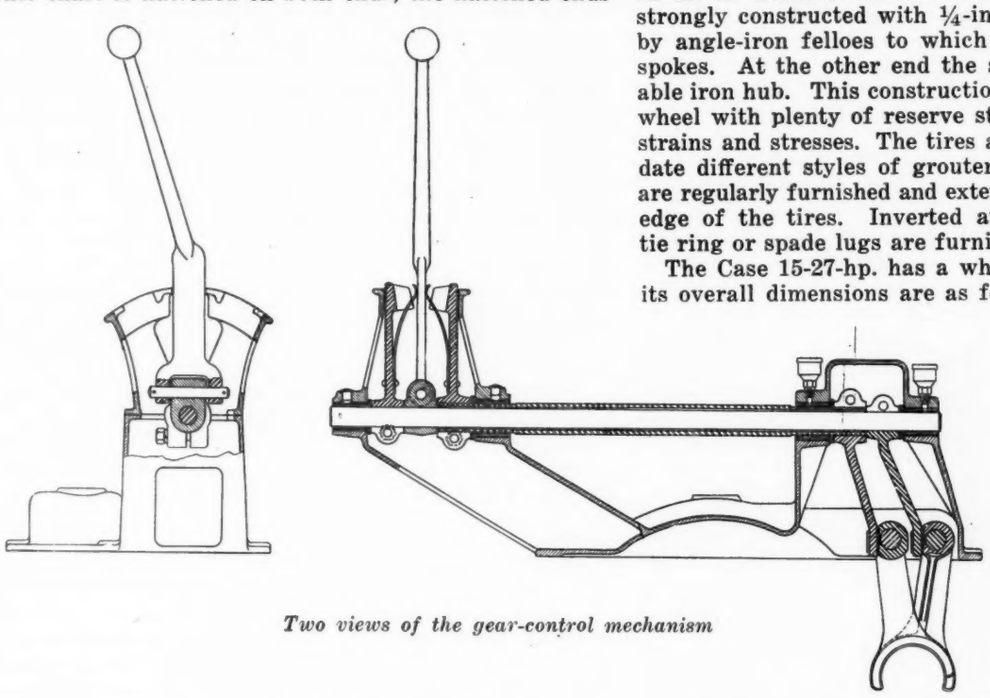
The transmission case is made of cast steel of deep section and is secured to the under side of the main frame by bolts of such length that they extend through the main frame and this case. These bolts are located at each side of the first and second reduction shafts and add strength to the main frame.

The transmission case performs the function of an oil pan for the transmission. The babbitted portion of this case is for the support of the reverse pinion shaft. This shaft is flattened on both ends, the flattened ends coming against the main frames, which prevents the shaft from turning and makes an easy assembling proposition as well as for the easy removal of the reverse gear and its shaft.

The belt pulley, which is 16 in. in diameter and has a 6½-in. face, is mounted on an extension of the engine shaft, and therefore runs at engine speed—900 r.p.m. The pulley being located on the same side as the tractor steering wheel makes it easy for the operator to line the machine up with the machine to be operated.

Power is transmitted to both rear wheels, which are 52 in. in diameter and have a 12-in. face. They are strongly constructed with ¼-in. plate tires, reinforced by angle-iron felloes to which are riveted twelve flat spokes. At the other end the spokes rivet to a malleable iron hub. This construction makes a solid, durable wheel with plenty of reserve strength to stand sudden strains and stresses. The tires are punched to accommodate different styles of grouters. Angle-iron grouters are regularly furnished and extend 6 in. beyond the outer edge of the tires. Inverted angle-iron grouters with tie ring or spade lugs are furnished on special order.

The Case 15-27-hp. has a wheelbase of 76½ in., and its overall dimensions are as follows: Length, 126 in.; width, 72 in.; height (without exhaust pipe), 68 in. The shipping weight is 5500 lb. The tractor pulls three 14-in. plows in tough sod or four plows under usual conditions. It is also adapted for other drawbar work requiring a similar amount of power, and it will operate either a 20 x 36 or 26 x 46-in. thresher.



Two views of the gear-control mechanism

Development of Military Aircraft in Great Britain

THE earliest type of British reconnaissance machine was the B.E.2 C., designed and produced by the Royal Aircraft Factory at Farnborough. The design was completed just prior to the outbreak of war, a fact which facilitated immediate production for the use of the Expeditionary Force. As far as possible, speed, climb and maneuvering ability were combined, although, compared with modern types, it was a relatively slow machine, making only 50 miles to 60 miles an hour with the 80-hp. engine with which it was originally fitted. This was followed by the Armstrong-Whitworth F.K. 8, fitted with 160-hp. Beardmore engines, which made an average speed of 82 miles an hour and could climb to 10,000 ft. in about 27 minutes. Toward the end of 1916, a forward stride was taken by the production at the Royal Aircraft factory of the R.E. 8 with a 12-cylinder R.A.F. engine. This machine has done the bulk of the artillery observation work in France, directing all the big-gun fire and barrage work. At 10,000 ft. it has a speed of 92 miles an hour, and can climb to that height in 11 minutes. It is fitted with camera and wireless equipment, and takes photographs of every "shoot." A bigger advantage was marked by the introduction of the "Bristol Fighter," a long-distance fighting reconnaissance machine, capable of traveling at 113 miles an hour at 10,000 ft. and climbing to that height in 11 minutes. Had the war continued, the Bristol Fighter would have entirely replaced the R.E. 8 for long-distance artillery work.

Aerial bombing was first undertaken in France by the Avro, a machine of moderate speed fitted with an 80-hp. Gnome engine. The observer's seat was used as a receptacle for the bombs, which were merely thrown overboard without the aid of the scientific bombing sights and elaborate bomb-dropping gear which have since made possible more accurate work. The first British machine specifically constructed for bombing purposes was the Short, a modified sea-plane, fitted with a 250-hp. engine and carrying four 112-lb. bombs under each wing. This type, which did most useful work in France, was followed by the Sopwith 1½ strutter, and later by the improved D.H. 4 and D.H. 9 machines. The D.H. 4 machine was originally destined as a fighter, but its trials disclosed such excellent lifting powers that it was converted to bombing purposes. It is capable of climbing to 10,000 ft. in 9 minutes, and has an endurance of 3¾ hours. The D.H. 4 and D.H. 8 machines have been fitted with Rolls-Royce, B.H.P., and latterly the Liberty engines.

Finally, the large Handley-Page machines were devised for the bombing of Germany. The first quantity production was begun in August, 1917, and the performance of the machine has justified its expectations. It is capable of carrying 2000 lb. weight of bombs in the fuselage, or 1500 lb. to suspend externally. The machines used by the R.A.F. Independent Force in the bombing of Germany have been the Handley-Page, D.H. 4, D.H. 9, and Sopwith "Camel." Not until the middle of 1915 were production machines armed with standard equipment. Two of the earliest types were the F.E. 2 B and the Vickers "Fighter." Both had an open cockpit, and were equipped with Lewis or Vickers machine guns. The year 1916 witnessed the introduction of the fixed machine gun firing through the propeller and fitted with the ingenious Constantinesco interrupter gear. Other types followed rapidly, leading up to the S.E. 5A, and lastly the Sopwith "Dolphin," the best and latest British fighting scout in the field.

Trend of German Airplane Design

A Summary of Features of Captured Enemy Machines, Issued by Technical Department (Aircraft Production), British Ministry of Munitions

ENEMY aeroplanes which have been captured intact or reconstructed have, under test, generally shown themselves poor in performance, judged by British standards, especially in point of speed at heights; but it would seem that as a rule they are fairly good in point of climb, and notably good in regard to maneuverability. Pilots report them, in the main, comfortable to fly and easy to land, especially the more modern types.

Wing Section

Scale drawings showing the wing sections employed are included in the detailed reports on the various enemy aeroplanes. In general they do not differ very markedly from British wing sections, though there is a distinct tendency toward rather greater camber. It is thought probable that this principle has been adopted so as to yield better results at high altitudes when the angle of incidence would necessarily be somewhat big.

Practically all German aeroplanes have a pronounced wash-out at the tip of the trailing edge. In the most recent example of Halberstadt design, namely, the C4 type, the lower wings are given a heavy wash-out at their junction with the bottom of the fuselage, the idea being to minimize the surface of discontinuity which would otherwise exist between the bottom surface of the fuselage and the wing roots. Thus the front spar is straight, but the rear edge is markedly concave. This effect exists to such an extent that the trailing spar is considerably bent as well as twisted.

The Fokker wing section is in a class by itself, not only on account of its great depth, but also in having only a very slight camber on the bottom surface. The performance of this machine is, however, by no means despicable, and it is generally conceded to be a redoubtable opponent in spite of the departure from optimum wing section which has been made.

Bays

As far as single and two-seater machines are concerned, the usual wing construction involves a single pair of struts at each side, but it is noticeable that in the latest model Pfalz scout, the D12, this practice has given place to double pairs of struts. Indications point to great strength having been made a matter of prime importance in this design.

In some types, notably the Pfalz and the Fokker, the upper plane is made as a single unit. In the latter case, the lower plane is also in one piece. In the generality of machines, however, the center section principle appears to be gaining vogue. Thus, whereas the L. V. G. C5 has a cabane consisting of the usual pyramid of struts, its successor, the C6, is furnished with a center section embracing a gravity petrol tank and the radiator, both of which are let into the plane flush with its top and bottom surfaces. The Halberstadt and Hannoveraner designs employ the same scheme.

Spars

Shortage of ash and spruce has led to the general adoption of built-up spars, which are of such a variety of types that a separate report is being issued upon their design. In nearly all cases ply-wood plays an important part. Thus in the Fokker biplane the spar, which, owing to the absence of the usual wire bracing of the wings, is extremely deep, consists of two thin rails of spruce united by deep ply-wood webs. In the Gotha bomber a built-up I-section spruce spar is covered in with ply-wood at each side. On the Giant four and five-engined bombers the spars are of hollow rectangular section, strengthened by a transverse web across the middle of the box. The latter is built of numerous components tongued and grooved together. The whole is strengthened by walls of multi-ply glued on each side. In the Halberstadt's design the built-up spruce spars are reinforced by broad horizontal webs of ply-wood running longitudinally, and at each edge of these are stringers. The whole spar construction thus represents a section similar to an H lying on its side, of which the central box spar forms the cross bar.

The A. E. G. machines are alone in employing steel tubular spars.

Other German designs, such as the Pfalz, D. F. W., L. V. G., Rumpler, and Albatross, employ built-up spars of the ordinary accepted type, either of box or I section.

Wiring

With the exception of the Fokker biplane and triplane, which have no external wire bracing whatever in the wings, the rigging of German machines is upon the accepted lines. The standard material is multi-strand cable furnished with whipped and sweated splices at the loops. Quick detachment devices, which at one time were fitted on several German models, have now disappeared. For internal wiring, both plain wire and stranded cable are used. In the Fokker design, the angle of the drag bracing cables between the struts seems to be very bad, but according to reports this machine is actually unusually strong. Drag bracings are in some cases taken from the front of the fuselage, but in most designs are confined to the interior of the wings. In no case is the undercarriage used to form a component of the bracing system.

In most machines the compression struts between the spars, for drag bracing, are steel tubes, but in some cases, notably the Fokker, Halberstadt and Albatross, wooden box ribs are used for this purpose.

Fuselages

The standard type of German fuselage construction embodies a three-ply shell built up on light wooden formers. It is generally of the wireless form, but in some cases the forward portion in the neighborhood of the wings and engine is strengthened with diagonal bracing. This is adopted also in the Gotha in that part of the body which embraces the cockpits and petrol tanks.

Exceptions from this general rule are the A. E. G. two-seater, the A. E. G. bomber, and the Fokker (biplane and triplane). In all of these steel is exclusively used for the fuselage construction, the transverse members being welded to the longerons. In the four and five-engined Giant bombers the rear portion of the fuselage, including the longerons, is of steel tube, while in the

Friedrichshafen bomber wooden longerons are used in conjunction with steel tube compression members.

In nearly all cases the wooden fuselage is roughly rectangular in section, with corners rounded off, and tapers to a vertical knife-edge at the rear. In the Halberstadt, on the contrary, it tapers, in a manner similar to that of the Bristol fighter, to a horizontal edge. In the Pfalz designs great pains have been taken to produce a fish-shaped body of perfect stream-line form; this is of approximately elliptical section throughout, though leaning toward a sharp "backbone" near the tail. The performance of this design is, however, relatively poor, and the rather elaborate streamlining appears to bring no great material benefits.

In the Albatross and the earlier Pfalz the fin is built in one with the fuselage, and very neatly faired off; but it is notable that in the latest Pfalz this practice has been discarded in favor of a detachable fin.

Tail Surfaces

The use of fixed fins and tail planes is now standard on all German aeroplanes, and in nearly all cases both the rudder and elevator are balanced. In some cases—notably the Fokker biplane—the fin is offset so as to mitigate the turning effect due to the swirl of the slip-stream. In the Hannoveraner fighter a biplane tail is incorporated with a view to reducing the blind area of the movable machine gun.

In all the big bombers—the Gotha, the Friedrichshafen, and the Giant machines of both types—a biplane tail is now a standard fitting, though it has not yet been adopted on the A. E. G.

In practically all cases the framework of the tail organs is of light steel tube, and in general this applies to the fixed planes as well as to the controllable surfaces. In the Pfalz, Albatross and L. V. G. designs the fixed plane frames are of wood and covered with thin plywood.

In some cases—notably the A. E. G. bomber—the fixed planes are of heavily cambered streamline section. The same practice, though to a less noticeable extent, is embodied in the latest Halberstadt; but in the Fokker, which is to be regarded as one of the most up-to-date German types, flat uncambered surfaces are exclusively employed. In this case, too, the fixed tail plane is made in one unit and dropped into brackets on the top side of the fuselage, instead of being constructed in two halves, and placed one on either side. This principle has also been adopted in the most recent Halberstadt.

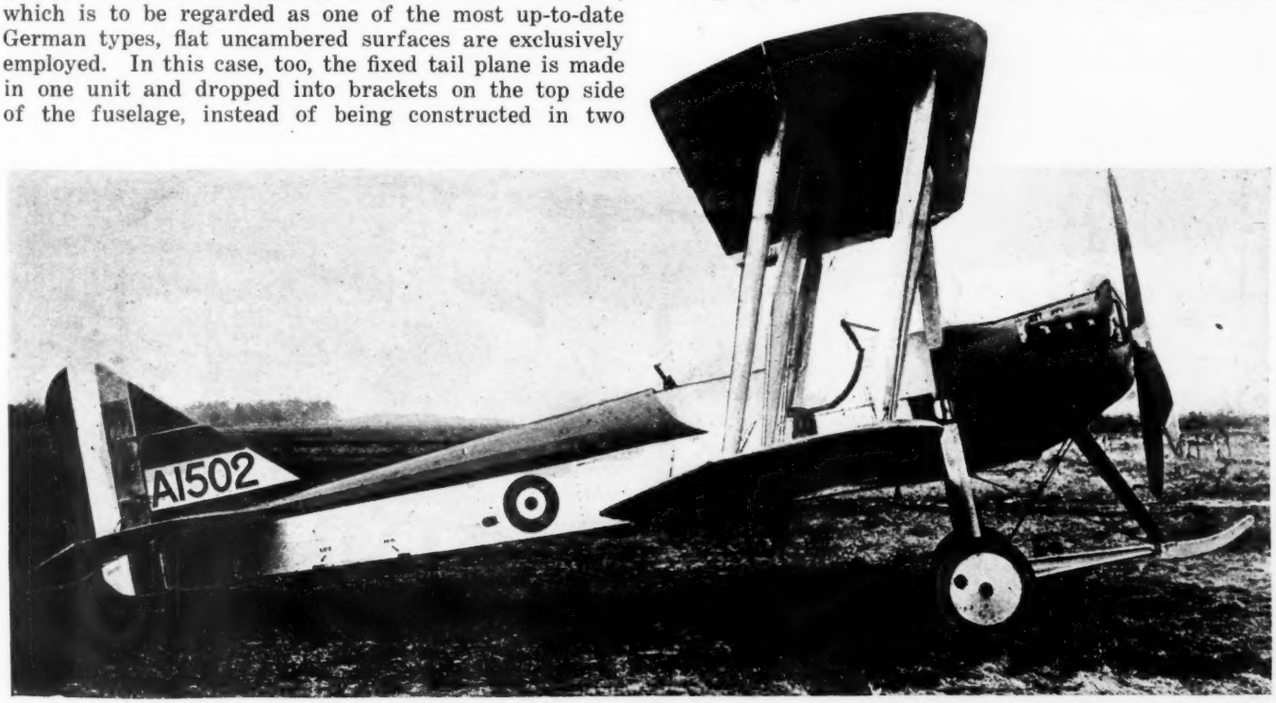
The control gear on German aeroplanes calls for very little comment, being, in all but the large bombers, of the standard universally jointed stick pattern. The arrangement of the rocking shaft varies, being, in some cases, fore and aft, and in others transverse. The rudder bars are almost invariably made of welded sheet steel, and are generally fitted with toe straps. In recent machines the pilot's seat is frequently adjustable, whereas in earlier designs it was more common to find the leg reach adjustable on the rudder bar. In several cases a locking device is employed, so that the elevator can be fixed at any angle. In the Fokker biplane the control gear is extremely light compared with that of other enemy designs.

Wheel control for the ailerons is only used on the large bombers, such as A. E. G., Gotha and Friedrichshafen. In the first-named, a dual control for the elevator and rudder is provided, but in the others no form of dual control at all is found. In the giant aeroplanes double control, operated by two pilots simultaneously, is adopted, as the physical effort called for is beyond the capacity of a single man.

Struts

Probably owing to a shortage of timber, wooden interplane struts are very little used, and are only found in the Friedrichshafen, L. V. G., and the older type of Pfalz. Steel struts are either tubes of round section faired off with a three-ply or solid wood streamlining, or of oval section, the latter practice being increasingly popular. In some cases the strut ends are tapered and welded to a socket; in others the tube is kept full section, and is dropped over an eyebolt at each end. N struts for the junction of the top plane and the fuselage are common, and are also used between the planes in the Pfalz and Fokker models. Oval steel tubes for undercarriage struts are practically universal, the L. V. G. being the only design incorporating wooden members in this position.

In general, there are two types of fabric found on



Armstrong-Whitworth with 90-hp. R. A. F. engine. Note front skid

enemy aeroplanes. They are of similar material, but differ in coloring. That intended for scouts and fighters is camouflaged in the familiar pattern of irregular polygons of light colors, while that for bombers is of such dark tones that the shapes of the polygons can scarcely be discerned. In some examples of the Fokker biplane the upper surface of the wings is painted a bright color, such as red, over the top of the dyed camouflage scheme. The Pfalz was formerly covered with an aluminum dope, but this has now given way to the standard coloring.

The quality of fabric is, in general, good, but in most cases the dope seems to be carelessly applied, and not thoroughly "worked in" to the material, from which it readily peels off.

Body Coloring

The bodies of aeroplanes are sometimes left in natural wood colors, as in the L. V. G.; sometimes, as in the Fokker, painted in two bands of bright colors; but more often covered with a cloudy camouflage effect, consisting of soft, low-toned colors, gradually fading into one another and apparently sprayed on.

It would appear that in recent designs the necessity of giving the pilot a good view has received more consideration than in the past. The Fokker, Hannoveraner and Halberstadt machines are excellent in this respect. The bombers seem also to be good, with the exception of the A. E. G., which is very awkward indeed.

Undercarriage

For scouts and two-seaters the plain axle slung to V struts is invariably adopted. In most cases neither the axle nor the tie rod is faired off, but in the Fokker types, both monoplane and triplane, the axle fairing has been developed into a lifting surface. In the larger bombing machines current practice varies considerably. Thus in the Friedrichshafen there are three two-wheeled axles —one under each engine and the third under the nose of the fuselage. This system has been adopted in some of the giant aeroplanes. In the Gotha there are two two-wheeled axles under each engine, while in the four-engined giant under each engine unit is a ponderous single axle supporting at each end four wheels placed side by side.

Rubber bands have now entirely disappeared, and their place has been taken by steel coil springs. In some cases three coils, of alternate "hand," are placed one inside the other; in others, three small coils are grouped together in a "clover leaf" and covered in with cotton fabric. The weight of spring used on the average machine is about 5 lb. for each wheel. In the Gotha the shock-absorber springs are concealed in the undercarriage struts, and are worked by a cable passing over pulleys. Steel-shod wooden tail skids are almost always used, but are not made steerable.

Engine Bearers

In most scouts and two-seaters wooden bearers, sometimes of ash, but more often of pine, are supported on multi-plywood bulkheads, but in the Fokker and A. E. G. designs the construction is of steel tubes, to which flat clips are fixed for the support of the crankcase arms. In the A. E. G. bomber the bearers are hollow steel of rectangular section. Owing to shortage of suitable timber, the bearers on the giant aeroplanes, which are necessarily very long, are built up of a soft wood center piece, reinforced top and bottom with five half-inch layers of ash.

Engine Controls

On a few machines—notably on the Hannoveraner—this is fitted in duplicate, there being, in addition to the usual throttle lever, another controlled by Bowden wire from the control stick. In the multiple-engined bombers separate engine throttle levers for each engine are installed, and in the two-engine type they are so placed as to be operated together when required. The same applies to ignition advance levers, but where Mercedes engines are used the ignition control is coupled up to the throttle.

Radiators

Several types of radiators are in use on German aeroplanes, and in nearly all cases they are fitted with some simple form of shutter, which is used in conjunction with an electrical rheostat thermometer. Formerly it was the general practice, especially in two-seaters of the D. F. W., Rumpler, A. E. G. and L. V. G. patterns, to mount a rectangular radiator in front of the cabane, just underneath the top plane; but in the latest L. V. G.'s this method has been discarded, and a curved radiator sunk flush in the center section is adopted in its place. Gen-

Armstrong-Whitworth plane with 160-hp. Beardmore engine

The twin engined FE-4 of the British Royal Aircraft Factory

erally speaking, this plane radiator is now standard in two-seater designs, but in the Pfalz, which previously incorporated this scheme, the latest pattern has a nose radiator of vertical tubes, the arrangement being somewhat similar to that of the Fokker biplane; these two machines are in this respect in a class by themselves.

On bombers the usual design embraces a car type radiator at the front end of the engine bearers, but in the four and five-engine giant machines the use of gear boxes has prevented this practice being adhered to, and in these the radiators are carried well up above the motors, and fixed either on the engine bearer struts or on wires.

In the flush pattern of radiator the tubes are horizontal and of flattened oval section, and are set with their major axis inclined. The tubes are in two cells, which are separated by baffle plates, which insure that the water runs from side to side, then down, and then from side to side back again. A short-circuit tube is nearly always provided to guard against the formation of air locks in the upper portion of the water tank. Another fitting frequently met with is a small subsidiary water tank mounted above the radiator and connected to the main filler cap with a tube. The top of this tank is fitted with a trumpet-shaped nozzle pointing forward.

Gears

It is significant that in the four and five-engined giant aeroplanes massive gear boxes are used in conjunction with standard engines of the Mercedes and Maybach types. As might be expected with six-cylinder motors, the gear boxes are very heavy. In the four-engine machines they had shallow casings fitted with cast aluminum cooling fins, and were connected to the engines by flexible couplings and external shafts. In the five-engine design the shafts are inclosed within the gear box. Plain spur pinions are fitted and the ratio employed both for tractor and pusher screws is 21/41. The gear boxes are of two distinct types—a short one for the tractor screw and a long one for the pusher. The latter is given considerable overhang in order to obviate the need for cutting away a section of the trailing edge to give clearance for the screw. This idea had been adopted both on the Friedrichshafen and Gotha designs, doubtless with some noticeable loss in efficiency.

Each gear box, including the flywheel on the engine which it necessitates, the flexible coupling, and the oil radiator, adds a weight of 346 lb.—a little over 1.15 lb. per horsepower. It is obvious, however, that the gain in propulsive efficiency is considerable.

The oil radiator referred to consists of a semicircular tank slung under the gear box, and containing 65 tubes of, roughly, 20 mm. diameter. Oil is circulated through this and the sump in the gear box by a pinion pump driven through worm gears and a flexible shaft from the driving pinion shaft of the gear box.

Fuel Systems

These generally incorporate two tanks—one gravity and one under pressure supplied by an engine pump—except where Benz engines are installed. In this case a fuel pump is employed, which supplies a tubular chamber, from which the overflow returns to the main tank; a hand fuel pump of the semi-rotary type is used for filling the gravity starting tank. The last named is frequently let flush into the center section of the upper plane, or is strapped on to it, except in the D. F. W. and Pfalz designs. In the former it is placed on the top of the main tank, and forms the back of the pilot's seat; in the latter it is under the engine cowling. In the Fokker, the main, auxiliary and oil tanks are incorporated in one unit, and a hand pressure pump is fitted for starting purposes. A small windmill, similar to that on the D.H.9 aeroplane, was found in the wreckage of the five-engined giant, and it is conjectured that the enemy may have turned his attention to this kind of fuel supply mechanism.

Owing to the shortage of the best classes of timber, mahogany and walnut are now frequently replaced by ash, pine, sycamore and maple. The screws of the giant bombers, being geared down, roughly, to 2 to 1, are not very heavily stressed, and are made entirely of soft wood covered with thin veneer, the grain of which runs across the blade.

The majority of German aeroplanes are internally wired for greater wireless capacity, but are only fitted with transmitting apparatus when this is actually going to be used. In some cases the dynamo is driven from a pulley on the engine in conjunction with a hand-controlled clutch, but in modern types it is commoner to find the dynamo supported on one of the undercarriage struts, and driven by a screw in the slip-stream of the tractor. On the five-engined giant a Douglas type horizontally opposed engine of about 3 hp. drives the wireless and heating generator.

Women Can Handle Exacting Work

Work Better in Groups—Temporary Lull in Demand for Women Likely

By J. Edward Schipper

ONE of the great lessons of the war in American manufacture has been the ability of women to handle exacting jobs. Considerable interest has been exhibited in the question of what is to be done with the women employees when the soldier comes back to claim his job. It presents a problem which is being solved differently in different plants.

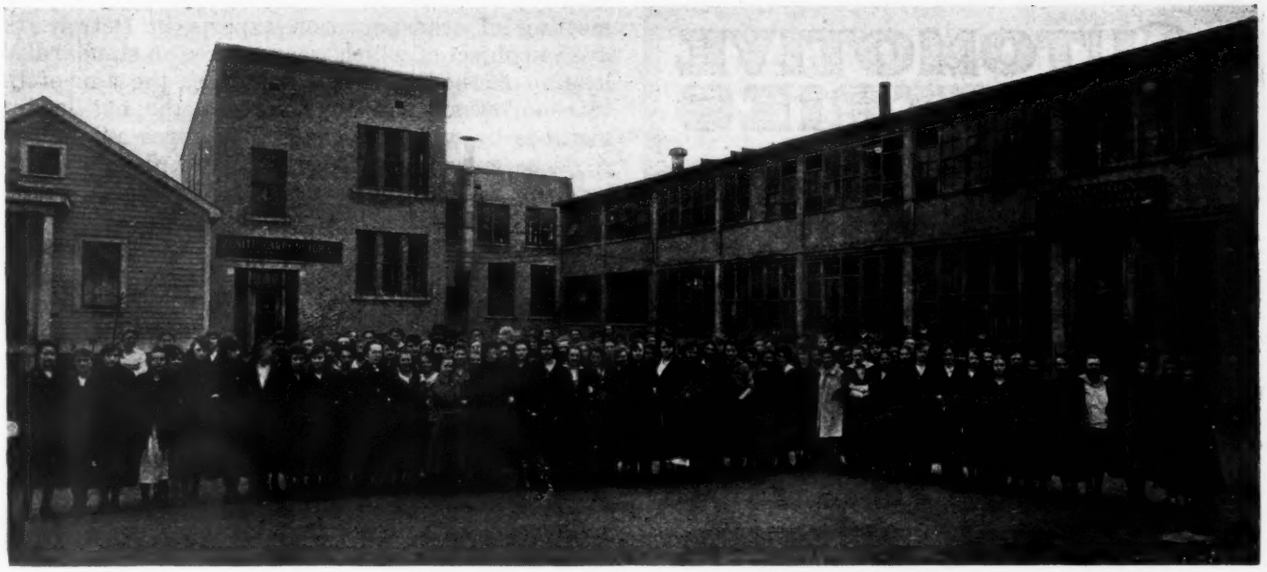
A large number of concerns have terminated the war work upon which the women were engaged and have laid off the women as well as the men who were doing the work before swinging back into normal manufacture. Nevertheless, the lesson has been learned that women can do this sort of work and do it as well as or better than men. There may be a temporary lull in which the excess of labor will compel factories to engage men and returned soldiers in preference to women, but it is quite certain that when the reconstruction period fully hits its stride the temporary surplus of labor will be readily absorbed.

The immense programs laid down by the Government for big engineering works and the policy of expansion determined upon by the largest manufacturers indicate that in about a year the pre-war scale of production will be exceeded. It is inconceivable that we are to go back to pre-war conditions. We have made advances in a great many ways, and the proof of the ability of women to hold their places in the industrial world has been one of these.

Never have any closer inspection systems been laid down than those used in Government airplane practice. Everything is required to be so exact that even minute variations from standard in the exterior finish of an airplane product have been deemed sufficient cause for rejection. At first, many who were used to commercial manufacture along other lines put forth strenuous objections, on the ground that not only was necessary production being delayed, but that costs were being run foolishly high because of the closeness of the work required.

With real adaptability, however, manufacturers soon began to meet requirements, and with a little yielding on the part of the Government along certain lines where

Girls at work in the Holbrook plant of the Cadillac Motor Car Co. welding the cylinders for Liberty airplane engines



Women employees of the Zenith Carburetor Co., which was engaged in the work of making carburetors for the Liberty engine

it was admitted that closeness of inspection was not essential, a happy balance was struck. Nevertheless, the work as a whole was to far closer limits, and held there with greater rigidity than was ever deemed possible in previous commercial manufacture in anything but precision instruments.

Adaptability of Female Labor

What is the most astonishing fact of all is that it was possible in this sort of work to employ female labor where it had never been previously thought of. Some of the illustrations herewith show a large number of girls doing acetylene welding on the water jackets of the Liberty engine cylinders. Cadillac and Packard both employed women for this welding operation, and both were highly satisfied with the results.

Work of this kind, which is departmentized, permitting women to be used in groups, has proved to be far more satisfactory than individual work where both men and women are employed in the same department. Experience has taught that in employing women for any sort of shop work, they are working to their best advantage in groups of five or more, under the control of a foreman or forewoman.

On war work the patriotism and *esprit de corps* of the woman workers was very noticeable. They were imbued with the idea that every job turned out was helping the cause, and this was a great spur to their endeavors.

An example of concentration on the work is very clearly shown in the large illustration herewith, depicting the welders employed on the Liberty cylinders at the Holbrook plant of the Cadillac Motor Car Co. Notwithstanding the time-honored reputation for curiosity, not one of the welders stopped her work or looked up at the camera while the picture was being taken.

Peace Also Will Need Woman Labor

The opportunities for women to be active in industry may decrease somewhat during the next few months, but if they do, it will only be a temporary lull, and as soon as the commercial and governmental manufacturing programs now being laid down are in full swing, every one of the women who found congenial industrial employment during the stress of war will find a job awaiting her in times of peace.

—

Inflammability of Aluminum Dust

ALUMINUM dust burns quietly when in a pile, but if this pile be disturbed in such a manner as to raise a cloud of the dust into the air the burning takes place with explosive violence. If a dust cloud already formed that has a density within the explosive limits be ignited, a violent explosion results. As several disastrous explosions of this dust have happened in manufacturing establishments, the Bureau of Mines has thought it worth while to investigate the physical and chemical properties of the dust with especial regard to inflammability and to the problem of extinguishing fires and of minimizing the force of explosions once started. The results of this investigation are recorded in Technical Paper 152 of the Bureau of Mines on The Inflammability of Aluminum Dust, by Allan Leighton. Water is worse than useless for extinguishing such fires. One method of subduing fires of aluminum dust is to pour oil onto the fire until it is smothered, and then use carbon tetra chloride to extinguish the fire in the oil.

A job where care and thoroughness are required—spraying the Liberty engine with oil to prevent rusting from dampness, before crating for overseas shipment

AUTOMOTIVE INDUSTRIES
AUTOMOBILE

PUBLISHED WEEKLY
Copyright 1919 by the Class Journal Co.
Vol. XL Thursday, January 30, 1919 No. 5

THE CLASS JOURNAL COMPANY
Horace M. Swetland, President
W. I. Ralph, Vice-President E. M. Corey, Treasurer
A. B. Swetland, General Manager
U. P. C. Building, 231-241 West 39th Street, New York City

BUSINESS DEPARTMENT
Harry Tipper, Manager

EDITORIAL
David Beecroft, Directing Editor
P. M. Heldt Sydney Oxberry
DETROIT OFFICE WASHINGTON OFFICE
J. Edward Schipper Allen Sinsheimer

BRANCH OFFICES
Chicago—Mallers Bldg., 59 East Madison St., Phone Randolph 6960
Detroit—95 Fort Street, West, Phone Main 1351
Cleveland— Guardian Bldg., Phone Main 1142.

Cable Address - Autoland, New York
Long Distance Telephone - 8760 Bryant, New York

SUBSCRIPTION RATES
United States and Mexico - One Year, $3.00
Canada - One Year, 5.00
Foreign Countries - One Year, 6.00

To Subscribers—Do not send money by ordinary mail. Remit by Draft, Post-Office or Express Money Order or Register your letter.

HORSELESS AGE SUBSCRIBERS
Subscriptions for the Horseless Age transferred to the subscription list of AUTOMOTIVE INDUSTRIES in the merging of the two publications will be completed in full by the weekly issues of AUTOMOTIVE INDUSTRIES to the dates of expiration shown on the records of the Horseless Age Co.

Owned by United Publishers Corporation, Address 243 West 39th St., New York; H. M. Swetland, President; Charles G. Phillips, Vice-President; W. H. Taylor, Treasurer; A. C. Pearson, Secretary.

Entered as second-class matter Jan. 2, 1903, at the post-office at New York, New York, under the Act of March 3, 1879.

Member of the Audit Bureau of Circulations.

Automotive Industries-The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903, and the Automobile Magazine (monthly), July, 1907.

Freight Car Loading Methods

DURING the freight car shortage of the past year many new methods of loading cars with automobiles were devised, all tending to make one car hold more automobiles than it had ever held before. As in so many other cases, necessity was the mother of invention. The automobiles had to be delivered, and it was impossible to get a sufficient number of freight cars. The only alternative to shipping by railroad was to deliver the cars by the drive-away plan, which was expensive and involved considerable risks. So the men in charge of the shipping departments began to ponder over the problem and evolved the new methods, some of which have been described and illustrated in these pages.

These new methods not only helped in tiding over the temporary car shortage, but will permit of saving on the transportation of automobiles in the times of peace ahead. Naturally the solution of the problem differed in the different factories, and as a result practice in loading cars has gotten into a chaotic state. The whole subject was discussed at a recent meeting of transportation experts in Detroit, the avowed object of which was to agree on standardized loading methods. It can hardly be the aim of the transportation men to revert to the old loading methods by which no more than three automobiles could be gotten into a car. What will undoubtedly be done is that the various new methods will be thoroughly discussed, their respective strong and weak points compared and a method standardized which will combine as many of the good points of the various plans now in use as possible. If this is accomplished the freight car shortage of 1918 will have yielded a permanent benefit to the automobile industry.

The Hotchkiss Drive

IT was predicted a year and a half ago, when the Government adopted the Hotchkiss drive for its Class B trucks, that if these trucks stood up under the severe condition of operation behind the battle front it would have a far-reaching influence on truck design after the war. A vehicle with Hotchkiss drive is obviously cheaper to manufacture than one having separate torque and thrust members, and as in connection with motor trucks considerations of economy usually predominate, the saving that may thus be effected is likely to prove an important item. Of course, it would not be quite right to say that the expense of making and assembling a pair of radius rods and a torque arm measures the difference in cost of a truck with Hotchkiss drive and one with special torque and thrust members. The problem is not quite as simple as that, for if the springs are only just sufficiently strong for the purpose of carrying the weight, it will not do to burden them with the torque and thrust loads in addition. Not only must the springs be made heavier for the Hotchkiss drive system—assuming, of course, the same flexibility—but special provisions must be made to adapt them to taking thrust loads without injury.

There is one other thing in favor of the Hotchkiss drive besides reduced manufacturing cost, and that is the flexibility which it gives the drive and which tends to protect the entire mechanism from the engine to the driving wheel when the driving power or the traction resistance is suddenly varied through a wide range. A slight amount of flexibility is usually obtained by supporting the forward end of the torque arm between springs, but it is readily seen that if the torque is resisted by the chassis springs the range of angular yield of the axle may be considerably greater.

Against these advantages of the Hotchkiss drive must be set its disadvantages. The springs of a truck with Hotchkiss drive are really combination or multi-purpose devices. They serve, in fact, a triple purpose, and it is logical to assume that if a special part were designed to serve each of these purposes it could be made to do it more satisfactorily or more efficiently. For instance, it is claimed, and apparently with good reason, that with the Hotchkiss drive the springs do not cushion shocks as well

as with other drives. This is probably due to the fact that in order to make the springs capable of giving satisfactory service as thrust members their arch or camber must be kept small, and this necessarily means that they must be made stiff.

It is well to consider these various advantages and disadvantages of the Hotchkiss drive, but the final decision regarding its relative merits, as compared with the conventional drive, will have to be left to the user. It has been proved that trucks can be built and made to stand up both with the Hotchkiss drive and with separate torque and thrust members. Any superiority in merits on the part of one or the other system must be slight, and we can hardly expect a convincing proof to be given on paper.

Truck Transmissions

IT is generally known that the operating conditions affecting the change gear or transmission are much more severe on a truck than in a passenger car. Gears are changed much more on the truck, which has to operate a great deal in congested traffic; the truck is usually operated by a driver of little skill, and the weight which must be accelerated and decelerated if at the moment of meshing the two gears run at unequal pitch line velocities are very much greater than in a passenger car. Therefore the clashing of teeth where sliding gear transmissions are used is often very severe.

Various engineers in the past have held the opinion that the sliding gear could not be used successfully on trucks. This belief has been disproved by practice. However, we are now reaching a stage of development where it is not a question of what can be used but what is best under the circumstances. And we believe the time has come when the question must be squarely faced whether the jaw-clutch type of gear is not more satisfactory, all things considered. True, it increases the bulk and weight of the transmission, but the destructive clashing is eliminated and it can hardly be doubted that the life of the vital parts is prolonged.

Heretofore the positive clutch type of transmission has not figured very conspicuously in American practice, but as a result of the war and its lessons in regard to various features of design new departures in different branches of automotive engineering are imminent. Rumors of new types of truck transmission are rife. Can it be that the positive clutch type of transmission is about to supersede the sliding gear for truck use?

The Chicago Show

ALTHOUGH technically known as a dealers' show, there is as much of a national aspect to the Chicago exhibition as ever. Manufacturers are just as strongly represented, and their business interest in the exhibition is keener this year than it has been for some time past. In fact, the Chicago affair is both a show and a post-war convention of the industry at which manufacturers of both cars and accessories are meeting their selling or field organizations for the purpose of laying down lines for the reconstruction period.

It must be remembered that in many cases dealer organizations have been rudely broken up by the call of war on the manhood of the country, also that under the stress of war conditions dealers were sometimes cut off by manufacturers who chose to keep a few large dealers alive with their limited production rather than attempt to spread this production so thinly over the country that it would do no dealer any good. In other words, except in the case of large production concerns, the organizations for intensive sales were destroyed.

The Chicago show is always looked upon as the business show of the year. Under present conditions the business end of the exhibit is vital. It is at the convention, which is going on in the different headquarters of the manufacturers in the Congress, Auditorium, Sherman and other hotels, that a great deal of constructive work is being done. Here practically every sales executive in the industry is busily engaged discussing plans for the coming year and mapping out territories. The results of this show are going to be a big factor in determining the production schedule in many factories.

There is also an important retail sales angle to the show, which is generally expected to release buyers. It is felt that what price reductions are to be announced will surely be disclosed at the show, so that in buying immediately after the show the prospect does not need to fear that his purchase will be followed in a few weeks by a price cut. It has been said, further, that the retail market is slow because buyers are holding back waiting for new chassis models. The absence of these at the show will clear this situation also.

Foreign Trade Conditions Improving

GRADUALLY the barriers which have hampered or prevented automobile trade between nations, except for war purposes, during the past several years are being removed. No step has yet been taken to lift the ban of automobile imports for private purposes into England and France, but when the doors are opened again, as they must be some time in the near future, commercial intercourse with these countries will be facilitated by the phenomenal reductions of 66⅔ per cent in ocean freights announced this week. The return of freight rates to a pre-war basis will be hailed with satisfaction by all industries and should result in a quick renewal of pre-war international commercial activities.

In Canada, which for a long time was the best customer of our automobile industry, conditions are also improving. Even as late as 1917 Canada imported a very large number of vehicles, but toward the end of the war the customs duty and local taxes were increased to such an extent as to almost kill the automobile business. This unfortunate result seems to have been noted by the Government, which has lost no time in rescinding the war taxes.

Latest News of the

Passenger Car Market Practically Drained at End of 1918

Only 15,000 Completed Cars on Hand December 31—Truck Production of 327,930 Planned for This Year—Will Make Chiefly 1, 2 and 5-Ton Vehicles

WASHINGTON, Jan. 24—On Dec. 31, 1918, only 15,545 finished passenger cars were in the hands of automobile manufacturers. This represents only three days' normal production — three days' normal sales. At the same time truck manufacturers planned a production of 327,930 motor trucks for 1919 — plans made after the armistice was signed—a production of 100,000 trucks more than that of 1918 and based on purely commercial absorption.

These figures exhibiting a passenger car market practically drained and a motor truck business anticipated for the coming year far in excess of even war demands are made public in a letter from C. C. Hanch, Chief of the Automotive Section, War Industries Board, to the industry. The letter states that production of passenger cars in 1918 totaled 926,388 as against 1,740,792 in 1917—a reduction of approximately 50 per cent.

Total motor truck production for 1918 was 227,250 as against 128,157 in 1917. The 1918 production included 164,264 for civilian use as against 109,865 for civilian use in 1917 and 62,986 for military use in 1918 as compared with 18,292 in 1917 — indicating a huge increase of trucks for commercial purposes during the war and despite it.

Production of trucks in 1919 as planned by the manufacturers shows a predominance of 1-ton trucks with 2-ton, 1½-ton, ¾-ton, 3½-ton and 5-ton next and in the order named.

A summary of the Government truck business shows 204,760 ordered, 98,000 delivered, 78,081 canceled and the balance of 26,679 due. The Post Office Department has made requisitions on the Army for 17,135 trucks.

Passenger cars ordered by the Government up to Jan. 1, 1919, totaled 38,-

(*Continued on page* 278)

—

S. A. E. Dinner List Tops 1000

NEW YORK, Jan. 29——More than 1000 tickets have been sold for the Victory dinner of the Society of Automotive Engineers, which is to be held at the Hotel Astor, Feb. 6. Reservations for the Midnight Whirl are above the 500 mark. Seats for both are limited, though a number can still be accommodated.

During the commercial vehicle section of the New York show a meeting will be held at the Automobile Club of America, which will be devoted largely to motor truck subjects. B. B. Bachman, engineer of the Autocar Co., will present a paper on the use of pneumatic tires for trucks. The date of the meeting is Feb. 10.

During the national tractor show at Kansas City there will be a combined dinner and meeting on the evening of Thursday, Feb. 27, at the Hotel Baltimore. A program of farm tractor subjects will be arranged.

Still another meeting of the society is to be held in New York during the Manufacturers' Aircraft Association's exhibition at Madison Square Garden. The date has not been definitely set as yet.

—

White to Make Trucks Only

CLEVELAND, Jan 27—The White Motor Car Co., while not withdrawing from the passenger car field, will devote its entire time to the manufacture of trucks. No passenger cars have been made since the start of the war, and the company does not contemplate putting out a new passenger car at present, but has planned the most extensive truck construction schedule in its history. A new type of White truck has been brought out and will be on exhibit at the New York and Chicago shows.

—

No Army Cars or Trucks to Be Sold

WASHINGTON, Jan. 28—No passenger automobiles or motor trucks have been or are being sold by the army, despite all rumors and reports to the contrary. AUTOMOTIVE INDUSTRIES makes this statement authoritatively, based upon information secured directly from the Motor Transport Corps of the army.

Various reports have been current throughout the East to the effect that passenger cars are being offered to the public by the army in lots varying from twelve to 100, and at ridiculous prices ranging from $300 to $700. Many of the reports even include the name of an imaginary army officer who is credited with offering the vehicles for sale. Army officials here have thoroughly investigated the rumors, probing deeply into the matter but have been unable to determine their origin.

As was announced earlier and officially by the War Department, no passenger cars will be offered for sale and no motor trucks will be placed upon the market except those which are unsuitable for army use. In this event they will be placed on the market. But none of the cars or trucks which will be so sold will be in driving condition.

—

Motor Guests at Aero Banquet

NEW YORK, Jan. 29—The Aero Club of America will hold its thirteenth annual banquet at the Waldorf-Astoria on the evening of Feb. 19.

Rear Admiral Robert E. Peary has accepted an invitation to speak upon flying over the North Pole, and the opportunity for great aerial transportation systems to be extended all over the United States.

Major General Charles T. Menoher, director of the Air Service, will speak on military aeronautics, and Rear Admiral Bradley A. Fiske, U. S. N., retired, will speak upon recent developments in naval aeronautics.

Rodman Wanamaker has accepted an invitation and will undoubtedly have some interesting announcements to make in regard to transatlantic flight.

Among the aces expected to be present are Colonel William A. Bishop, V. C., D. S. O., M. C., D. F. C.; Lieutenant Colonel William Thaw, Captain Edward V. Rickenbacker, Captain Arthur J. Coyle, in command of the First Aero Squadron, and one of the 300 aviators trained by the Aero Club of America in 1915-16, and as many of the American aviation officers from the front as are free to attend.

The Honorable Fiorello H. La Guardia, major in the Air Service and member of Congress, will speak on the developments in aviation in Italy. An invitation has been extended to Signor Gianni Caproni, who is expected to arrive in this country.

—

Army to Keep Soldiers Until Employed

WASHINGTON, Jan. 25—To prevent a serious unemployment situation in this country, the War Department has ordered that no soldier be discharged from the army against his desire until such time as he can obtain employment in civilian life.

—

Roamer to Make Custom Bodies

KALAMAZOO, Jan. 29—The Barley Motor Car Co., maker of Roamer cars, has added a custom body department to its factory, which will enable it to make all roadster bodies as well as open and closed jobs.

Automotive Industries

Detroit Optimistic Regarding Future

Unprecedented Prosperity Anticipated When Contracts Are Adjusted

DETROIT, Jan. 25—Immediate settlement of war contracts will bring to this district an unprecedented era of prosperity. Approximately $300,000,000 outstanding on uncompleted contract work is the brake grinding against the wheels of the automotive and allied industries and it is this brake which will keep the city's great manufacturing plants at slow speed until Congress acts to lift it.

For the most part, this idle money represents working capital. Plants invested heavily in war materials on the assumption that the war would continue for some time. But the war ended abruptly. It caught them just commencing new contracts or in the very midst of government work. Heavy material expenditures had strained their finances and contract cancellation found the mass of contractors short of the funds necessary to meet the unexpected expenditures required for production.

To-day the business outlook was never more golden. There is already a brisk demand for automotive products. Every other line of business is facing a great year. But business here seems to be held in leash. It is waiting for something and that something is action on the part of the big manufacturer. It waits for him to lead the way, but as a purely business proposition he is going to play safe. His resources are badly strained and he in turn is waiting for the Government to refund him his money before he starts operations on a greater scale. While contract delay is not the only factor retarding industrial work during these trying reconstruction days, it is without a doubt the greatest, and its elimination will go far toward dispelling the element of uncertainty now dominating business circles.

The work of transition from gun carriages, airplanes and shell to the production of cars, trucks, tractors, parts etc., is being accomplished with remarkable swiftness and precision in scores of local plants. Over 90 per cent of the automotive plants of the city were engaged in war work of some kind or other. Some factories conducted munition departments and continued their regular automotive departments as well. Others devoted their entire energies to war work.

The automotive industry right now is devoting more of its attention to getting ready for business than in the production of cars, tractors and trucks. In many plants February will find reconstruction work about complete. Sales departments, more or less disorganized when companies were engaged in from 50 to 100 per cent war work, are now reorganizing. New dealers and distributors are being lined up and purchasing departments are busy arranging for parts and material. Sixty days will see the majority of the local firms rounding into normal pre-war production again.

—

Organization of Director of Sales

WASHINGTON, Jan. 29—The organization of the office of the director of sales of the War Department includes Colonel Fred Glover, who will handle trucks and motor equipment, including motors, motorcycles, side cars and all surplus supplies and repair parts; Colonel A. LaMar, in charge of machine tools, including cranes, storage equipment, steam shovels, etc.; Major W. M. Crunden, who will handle building material; L. H. Hartman, in charge of Quartermaster stores, including rubber goods, gasoline, etc.; G. F. Woods, who will control real estate; Captain A. L. Mercer, in charge of raw materials, including pig iron, platinum, manganese, chrome, etc., and one other who is to be named, in charge of the disposition of ordnance supplies, including artillery, guns, etc. Under the director of sales, C. W. Hard, is an assistant, E. C. Morse, who serves as chairman of the Board of Sales Review, which also includes those officers and civilians named above.

—

Exporters to Confer on Parcel Post

WASHINGTON, Jan. 29—Second Assistant Postmaster General Praeger has sent out an invitation to exporters throughout the country for a conference to consider important questions and exchange views on the improvement and expansion of the international parcel post. The conference is called for 10 a. m., Feb. 11, at the Post Office Department in Washington.

—

Withdraw Ban on Aircraft Show

WASHINGTON, Jan. 29—As was announced in a recent issue of AUTOMOTIVE INDUSTRIES, restrictions upon private airplane exhibitions are withdrawn. This announcement, following a cable from President Wilson, has now been confirmed by a proclamation.

826 Farm Tractors in France

According to French Ministry of Agriculture, 779 Are American-Made

By W. F. Bradley

PARIS, Jan. 16 (By Mail)—France possesses 826 agricultural tractors, of which 779 are of American origin. The forty-seven of French manufacture comprise twenty Fitz, twelve Doizy, three De Dion-Bouton, ten Tourand-Latil, and two Julien. These figures are issued by the French Ministry of Agriculture and are official. They appear, however, to cover gasoline tractors only, for there are a certain number of steam tractors in use in France which have not been taken account of.

Although practically 95 per cent of the tractors used on French farms are of American origin, they are not all of a suitable type. During the war the French Government has imported tractors and frequently has purchased what happened to be available, rather than what was most suitable. Very little has been done with tractors for working in vineyards. These tractors should have a maximum width of 39 in. They should be able to plow to a depth of 4 to 6 in., and scarify to a depth of 2 in. These tractors, together with the plow or cultivator, should be able to turn around within a distance of 116 in., and weight should not exceed 2400 lb.

The manufacture of argicultural tractors has been dormant in France during the war, for neither material nor labor was available for this work. All indications point to the tractor business getting into the hands of the automobile manufacturers. Those who are in a position to produce almost immediately are De Dion-Bouton, who has two types of tractors ready and the Latil Co., who has specialized on one type.

Latil is the leading French manufacturer of four-wheel type tractors, which he has been building during the war for the Allied armies. This factory is entirely modern and is well equipped for producing agricultural tractors. The type adopted has been developed by M. Tourand, who has specialized in agricultural work for a number of years.

This combination of an agricultural machinery specialist and an automobile manufacturer is a good one. In France there is a tendency for automobile manufacturers who have good engineering experience, but who possess little agri-

(*Continued on page* 282)

British May Drop Import Embargo

American Automotive Importers in London Have Hopes of Speedy Relief

NEW YORK, Jan. 28—Advices from London, England, state that although much apprehension has been felt by the distributers of American cars, trucks and automotive products generally in regard to the attitude of the British Government on the question of restrictions on imports, it would seem that the chief anxiety exists on account of the possibility of maintaining the wartime embargo, rather than that there will be a partial restriction effected by the imposition of a duty.

The main reason for believing that something along the lines of a maintained embargo would be advocated arose from an interview granted a deputation of British manufacturers by the president of the British Board of Trade, who said he "pledged himself that the restrictions on importations which had been lifted for three months shall be reimposed at the expiration of that period, and that there shall be no further removal without the manufacturers of the country being consulted."

He also stated that he "realized that it might be necessary to impose further restrictions."

Naturally this statement created a certain amount of unrest among importers of American goods and as a result a deputation of the automotive men in London interviewed the head of the Department of Import Restrictions, in the absence of the president of the Board of Trade. This official promptly stated that it was a mistake to suppose that the British Government contemplated a policy of exclusion and added that it was anxious to consider any and all representations made by importers of American made products. He suggested that the automotive importers should draw up a statement of the amount of goods each firm expected it would need to maintain itself until the situation cleared.

It is now considered that there is every hope of relief and that with increased shipping facilities the position of imports of automotive products into the United Kingdom will be greatly facilitated. It is noteworthy that the American automotive men in London were the first to take active steps to ascertain the exact position and the feeling of the British Government in regard to the situation. The deputation was representative of the motor trade group of the American Chamber of Commerce in London.

—

Simplified Export Application Form

WASHINGTON, Jan. 25—A new and more simple export license application, known as form X-A, has been placed in use by the War Trade Board for applying for export licenses to ship to any country, in place of form X used heretofore. When form X-A is used it will no longer be necessary to use supplementary information sheet X-119 for shipments to Denmark, Holland, Norway or Sweden.

—

Cheap British Cars a Thing of the Future

NEW YORK, Jan. 23—For the time being at least the United States has little to fear from British competition in the motor industry. British manufacture, hampered and restricted by the war for the past 4 years, will take some time to get back on its feet, according to Gerald Bliss, writing in the London *Daily Mail*. Discussing the very doubtful possibility of cheap car manufacture in England at present he says:

"One of the many post-war mysteries is the price at which motors of all sorts and sizes will be sold, a mystery unknown to the very manufacturers themselves.

"All they can do is to invite the public to put their names down on what are in many cases already very long waiting lists to 'wait and see' in conjunction with themselves.

"Some articles upon the $500 car written during the period of suspended motoring have led a considerable portion of the public to anticipate a sort of 'Rolls-Ford' presenting itself at their doorsteps and asking to be bought at that price for a Christmas present.

"The $500 car will come, but it will take some years of quantity production with our enlarged factories working at full swing under rebalanced peace conditions, and with raw material neither rationed nor being sold under conditions of the keenest competition for limited supplies.

"Meanwhile the present price of the proverbial Ford (minus any suggestion of the Rolls)—if and when obtained—shows that even in this pioneer case war conditions have put the cost up very considerably, and that it, too, for the time being, shows no eagerness or ability to sell at $500. So what chance for others?

"There are four prime and direct factors affecting the price of cars, not only in this country but others as well, though not so much so in America for reasons more or less obvious. First, the price of raw materials; second, rationed quantities limiting production and fettering organization, thereby raising the all-round cost of running a factory; third, the cost of factory reorganization and the attendant difficulties, and fourth, the great increase in wages all round—not only in motor factories.

"Practically no cars have been manufactured in this country for civilian consumption for over four years. In consequence, second-hand prices for immediate purchasers have been soaring for some time, not without a suspicion of profiteering in certain cases, and the automobile industry in all its branches does not want to be tarred with the same brush.

"In 1914 prices, with stability, improved production and established organization were dropping. Since then there have been no price lists. When the industry is next in a position to issue such official lists cars will be found to be up 40, 50 or possibly even more per cent to start with, and it will look a big jump. But I do not fancy that they will be found to have risen in the same proportion as most other things we have been buying without interruption. That will be the first touchstone of their cheapness. Meanwhile the British industry has to find its feet again."

Canada Expects Car Tax Reduction

Total Taxation Plus Duty Over 50 Per Cent—War Tariff May Be Removed

WINNIPEG, CANADA, Jan. 24—Two Ottawa dispatches of the last few days refer to important tariff revisions and indicate that the automobile, which has been bearing a big burden of the war-time taxes, may shortly be relieved of some of the load. Representatives of the organized automobile industries of Canada recently waited on Sir Thomas White, acting premier, and Hon. A. K. MacLean, acting minister of trade and commerce, urging the removal of the excise war tax on automobiles. This surtax, which was imposed in the last budget, amounts to 10 per cent on all automobiles, and is applicable to imported cars or cars manufactured in Canada and unsold on April 30, 1918. The plea for the removal of this excise duty is being considered by the authorities at Ottawa.

Another measure which it is rumored in Ottawa dispatches will feature in the budget at the coming session is the removal of the general war tariff increase of 7½ per cent, put into force during the early months of the war on almost all commodities. This, of course, has been tacked on to the high cost of automobiles for some time, and its removal will be a relief to dealer and consumer.

Prospective buyers who have watched the soaring prices of motor cars during the past year or two have no doubt attributed most of the increase to the rising costs of materials and labor. Few, probably, have been aware of the taxes borne by the automobile since August 4, 1914.

The original duty at that date was 35 per cent. Shortly after war broke out, the Canadian Government imposed the war tariff increase of 7½ per cent; total tax from that date onward—42½ per cent. Then the United States placed a 3 per cent tax on factory output. This increased the cost of the car to the dealer 3 per cent, and he was also forced to pay the 42½ per cent on this additional 3 per cent. Then along came the Canadian excise war tax of 10 per cent on the list price of the car and freight increases have jumped just about 100 per cent.

—

American and British Governments Cut Ocean Freight Rates 66 Per Cent

NEW YORK, Jan. 28—The British Ministry of Shipping announced yesterday that ocean freight rates on vessels free from Government requisition had been reduced 66 2-3 per cent on shipments from the United States to Great Britain. This applies to all export commodities except cotton, and it also applies to British ships which have from 20 to 30 per cent of their cargo space available, the remaining being under control of the Ministry of Shipping.

To meet this cut the United States Shipping Board announced a similar reduction in charges between Atlantic and Gulf ports and the United Kingdom, France, Italy, Belgium and the Netherlands.

Approximately, the reduction means a drop from $3.50 to $1 per 100 lb. and a reduction from $1.75 to 50 cents per cubic foot for goods shipped by measurement. Shipping men say that even with the present high cost of operating vessels the new rates will leave a margin of profit.

—

Mexico Sends 3,838,195 Bbl. Oil Here in November

WASHINGTON, Jan. 25—Declared exports of crude oil and petroleum products from Tampico, Mexico, to the United States in November, 1918, totalled 3,838,195 bbl. The movement from Tampico was 2,575,700 bbl., from Tuxpam 852,094 bbl. and from Port Lobos 410,401 bbl. Shipments to points other than the United States during the same period from this district totalled 1,617,542 bbl.

—

December Oil Exports Decrease

WASHINGTON, Jan. 27—Mineral oils totaling 2,714,430,452 gal., valued at $344,290,444, were exported during the year of 1918, as compared with 2,651,118,349 gal., valued at $2,252,977,476, in 1917. December, 1918, shipments of mineral oils totaled 186,723,651 gal., valued at $29,027,415, as against 300,286,827 gal., valued at $29,173,907, in December, 1917. The decrease in quantity in December, 1918, was undoubtedly due to the armistice. Following is a tabulation of the complete exports during December, 1918, and December, 1917, and the years 1917 and 1918:

Months	1917	1918
January	47,967,354	42,607,206
February	41,352,711	44,384,937
March	47,868,652	48.631,115
April	41,854,320	46,590,570
May	47,086,452	50,927,195
June	46,824,646	51,758,214
July	46,291,572	55,587,312
August	47,372,226	55,732,092
September	45,107,956	51,757,334
October	48,337,726	52,885,513
November	47,689,801	44,386,987
December	44,037,147	40,634,525
Total	551,790,563	585,883,000

—

Imports to Mexico Exempt from Tax

WASHINGTON, Jan. 25—In view of the export figures of cars, trucks, parts, etc., from the United States to Mexico for the past few years, the report received here from Ambassador Fletcher should be of importance to those engaged in automotive export lines. According to this report, exemption from import duties has been granted on motor vehicles of all descriptions by the President of Mexico under a decree signed last week.

From 1908 to 1918 exports of passenger cars from the United States to Mexico were 7,540 cars at a value of $6,462,511. Within the past six years Mexico received from the United States 249 motorcycles, valued at $64,830; 689 trucks, valued at $939,679; nine airplanes at a value of $68,500, and airplane parts to the amount of $19,725.

France Provides for War Car Repairs

Makers to Repair French Cars —Army Shops to Handle Foreign Makes

PARIS, Dec. 23—Definite announcement has been made by the French Government on the method of handling the trucks and cars it has in its possession and which will no longer be required when the armies are disbanded. The total number of vehicles is 79,318, composed as follows:

French-built Vehicles	
Trucks	34,385
Tractors	4,812
Touring cars	19,044
	58,241

Foreign-built Vehicles	
Trucks	13,360
Tractors	2,217
Passenger cars	5,500
	21,077

All the French built cars and trucks will be returned to their respective manufacturers in order to be repaired at Government expense, and will then be sold through the usual dealers. If the manufacturer refuses to take back his cars for this repair work, they will be turned into the army repairshops for the necessary work. When the vehicles are returned to the manufacturer for repair and sale, it is understood that a price will be fixed by mutual agreement, and also the commission which the manufacturer and the dealer will be allowed for their part in the transaction.

Foreign built automobiles and trucks will all be repaired in the army shops. It is intended to form a company in which all the big transportation organizations will have a part, which will take over all the foreign-built automobiles now in the French army and such French automobiles as the manufacturers refuse to handle. This company will thus have to receive a minimum of 20,000 automobiles, but in case the manufacturers do not care to handle their own vehicles, may have to receive more than 50,000.

The company will rent the vehicles placed in its possession to whatever organizations are in need of transportation. These will include many of the local railroad companies, the various municipalities in the devastated and other regions, builders undertaking reconstruction work, etc.

The holding company will be responsible for the maintenance of these automobiles so long as it is possible to keep them in service. As the vehicles wear out they will be scrapped, and the importance of the holding company will gradually decrease.

Although not forming a part of the Government scheme, it is known that many American manufacturers having cars and trucks now in the service of the French army will establish supply depots in order to help keep these trucks in service. Without such depots it is obvious that the cost of maintenance will soon run so high that the trucks will have to be abandoned at an early date.

An impression has gotten abroad in France that automobiles owned by the English and American armies would be left behind, and would have to be absorbed by the French nation. This is quite incorrect. The British authorities have arranged for all English army trucks to return to England, and the American army will send across the Atlantic the 81,000 automobiles it now possesses in France—or, at any rate, as many of them as are worth shipping home.

—

Automobile Manufacturers of France Entertain Louis Renault

PARIS, Jan. 12—Louis Renault was the guest of honor yesterday at a banquet given by the Automobile Manufacturers of France, in order to commemorate his promotion to the rank of officer of the Legion of Honor, which was awarded him because of the important role his factory has filled during the war and particularly for the designing and production of the Renault light tank.

This tank was designed late in 1917 and went into action in the beginning of 1918. Louis Renault equipped his factory to produce 12 tanks per day and when the armistice was signed had delivered about 2,500. In addition, the tank was built in accordance with his designs by other factories in France, Italy and America.

The banquet, which was attended by all the leading members of the automobile industry, was presided by M. Loucheur, who, during the war, was Minister of Armaments, and now occupies the post of Minister of Industrial Reconstruction.

—

Egyptian Cotton Import Restrictions Off

WASHINGTON, Jan. 26—The War Trade Board has removed all restrictions on the importation of Egyptian cotton, except as to the relations with the Textile Alliance, Inc., but it is still too soon to estimate its effect on tire manufacture. In fact, since the restrictions are off, none of the raw Egyptian cotton has had time to come into the country. During the past year, however, while the regulations were in effect, only about 50 per cent of the usual amount of 100,000 bales of Egyptian cotton came into this country. Of that amount the Government took about three-fourths for its own needs, leaving only 25 per cent for the manufacturers. As a result, tire makers were forced to manufacture with domestic cotton, which did not prove as satisfactory as the imported.

Licenses will now be granted freely for the importation of cotton of all grades from any country when the applications are otherwise in order. As the importation of Egyptian cotton is largely a question of steamship space, even with the restrictions off, the amount brought into this country will depend on the amount of shipping space available.

Consider Validating Measure

Senate Starts Hearings on Bill to Legalize Contracts —Two Amendments

WASHINGTON, Jan. 28—Consideration of the bill to validate informal war contracts was begun by the Senate yesterday. The contracts, which total $2,000,000,000 and include $300,000,000 worth of business with automotive companies, are those which were not formally made. The bill, which was published in these columns last week, permits the Secretary of War to adjust the contracts and provides for a commission to which appeals may be taken if Secretary Baker's decisions are unsatisfactory.

Senator Chamberlain, in charge of the bill, stated that delay in passage of the bill will bring disaster upon the country, continue to increase unemployment and work serious hardships upon industry.

A three-cornered discussion took place when adherents of the Dent bill, which has already been passed by the House and which was published in these columns several weeks ago, attempted to urge their bill, and Senator Hitchcock in turn spoke in behalf of a bill he has presented at the behest of the New York City Chamber of Commerce, while Senator Chamberlain demanded the passage of his bill at an early date. No definite action was taken.

Senator Hitchcock offered an amendment which was characterized as an attempt to again place complete charge of validation of informal contracts in the hands of the War Department, and Senator Pomerene offered an amendment to "protect the sub-contractors."

Following is the amendment suggested by Senator Hitchcock, which was ordered printed and will be laid before the Senate to-day:

"In line 3, page 1, after the word 'that' strike out all down to and including line 24, page 3, and insert the following:

"Where during the present war and prior to November 12, 1918, officers or agents acting under authority of the Secretary of War and placed orders or made contracts with manufacturers or contractors for war supplies or materials, or for the performance of work thereon, or for the construction or enlargement of plants or other preparations necessary to furnish supplies or material for the War Department, the procurement of which has heretofore been authorized by Congress, and any of said orders or contracts has been partly or wholly performed, or expense has been incurred by the manufacturer or contractor prior to the twelfth day of November, 1918, in preparation or partial execution of said contract or order, the fact that any such contract or order or agreement has not been made in the form or signed in the manner required by law shall not invalidate the same, if it was entered into in good faith and lacked only the sanction of a contract in legal form. Nothing herein provided, however, shall be held to validate any contract, order, or agreement given or made by an officer or agent of the War Department not legally qualified or authorized to give a formal legal contract, except where such officer has signed as the representative of a superior officer authorized to make such contract, nor to permit an officer to make such contract with any company, corporation, or firm in which he has, or had at the time, directly or indirectly any interest.

"Sec. 2. That in all cases as above included it shall be lawful to make payments under the terms of the contracts or orders so made or given to the extent that performance thereof has been made, expenditures incurred, or supplies thereunder have heretofore been received and accepted by the United States, provided that payment in such cases shall not exceed the fair value of the supplies or materials delivered to and accepted by the United States, together with remuneration for expenditure properly incurred in preparing to perform said contract, orders, or agreements.

"Sec. 3. That in case of the cancellation, suspension, or annulment of any contract, order or agreement as described in this act, by the Secretary of War, or officers or agents acting by his authority, and in cases where no property or supplies have been delivered to and accepted by the United States, or where only partial delivery and acceptance has been made, contractors shall file with the Secretary of War within 60 days after the passage of this act any claim for remuneration arising out of the discontinuance, cancellation, or suspension of such contract, agreement, or order, properly itemized and set forth. Each claim shall thereupon, or as soon as possible, be transmitted to and filed with the commission hereinafter provided for, together with a statement attached thereto, showing the amount, if any, which the War Department deems to be justly due to said claimant. If the claimant shall file a statement offering to accept the amount awarded by the War Department in full for said claim, the commission shall, within 10 days, order the same paid in the absence of evidence that it is excessive.

"Sec. 4. That for the adjustment of all claims arising out of the cancellation of contracts, orders, and agreements for supplies or materials of war, as described in the foregoing paragraphs of this act, there is hereby created an adjustment commission to be composed of 3 members, to be appointed by the President and confirmed by the Senate, one representing the War Department, one representing the Department of Justice, and one representing the business interests of the country, none of whom shall be interested in any contracts with the Government or have any interest in any firm or corporation having war contracts, who shall hold their offices for 1 year and receive as compensation a salary of $10 000 each. It shall be the duty of said commission promptly to examine and pass upon all claims for compensation and reimbursement arising out of cases as set forth in this act of supplies furnished, expenditures or obligations necessarily incurred, or materials purchased under faith of contracts in legal form or orders received from officers and agents of the Secretary of War as heretofore set forth.

"Sec. 5. That in each case, as soon as the commission has made an award, the contractor shall be entitled to receive the same upon giving receipt in full of all demands against the United States arising out of the transaction, or if the contractor is not satisfied with the amount so awarded he shall be entitled to receive, and shall receive at once, 75 per cent of the amount that has been awarded him, and he shall thereupon be entitled to appeal the case to the Court of Claims, which is hereby given jurisdiction to hear the case and render final judgment in such sum as may be required to reimburse the contractor for supplies and materials delivered to and accepted by the United States and expenditure necessarily incurred in good faith in the partial performance of the contract or order above referred to, or in preparing for the same.

"Sec. 6. That in no case, however, shall any award, either by the commission or the Court of Claims, include prospective or possible profits on any part of the contract beyond the goods and supplies delivered to and accepted by the United States and a remuneration for expenditures necessarily incurred in preparing to perform said contract or order so canceled.

"Sec. 7. That the purpose of this act being to secure prompt settlement of claims, the commission is authorized to make its own rules and regulations and to hear and determine the issue informally and promptly upon presentation of the case. The commission is authorized to appoint, under such rules and regulations as it shall prescribe, one or more regional boards of examiners to serve in such districts throughout the country as the commission shall fix and determine to investigate and determine the facts concerning claims, legal or equitable, that may be presented as herein prescribed. The members of such board shall be composed of one representative of the War Department, one representative of the Department of Justice, and one from the business interests of the region, none of whom shall have any interest in the contract, directly or indi-

(*Continued on page* 275)

Makers Discuss Plans of Loading

N.A.C.C. and Master Car Builders Confer on Method of Freight Car Loading

DETROIT, Jan. 24—A meeting to determine how motor vehicles should be loaded for shipment was held Thursday, Jan. 23, at the Board of Commerce. It was arranged by the National Automobile Chamber of Commerce and J. S. Marvin of that organization, explained that the purpose was to receive from army officers and the Master Car Builders' Association their proposed specifications and blue prints to govern the loading of motor vehicles on freight cars.

This follows a preliminary conference at Washington a month ago, and as a result of the meeting the Government officials are to be furnished with specifications and other data showing the present loading methods of the various factories here. Many suggestions were made by the shippers and the changes in the proposed rules adopted. It was expected that further changes would be made before the final approval of the rules which will be binding on all shippers when printed and approval by the Railroad Administration.

This matter is of vital importance to the motor vehicle makers, many of whose shipments run from 50 to 100 carloads per day, and any serious deviation in the fastenings of the machines in the cars for transportation makes an important item of expense, weight of load and liability of damage.

The meeting was attended by Captain H. R. Moody, chief of the packing and service division, Quartermaster Corps; Captain E. S. Evans of the same department; J. J. Burch, chairman, and other members of the committee on loading, Master Car Builders' Association; L. J. Markwardt and H. J. Hegal, forest products laboratory, Forest Service, U. S. D. A.; William E. Metzger, chairman, traffic committee, National Automobile Chamber of Commerce; E. N. Hodges, chairman of the Detroit traffic committee of that organization and representatives of the following motor vehicle manufacturers: Anderson Electric Car Co., Cadillac, Chalmers, Dodge, Denby, Ford, General Motors, Hudson, Hupp, King, Maxwell, Packard, Paige, Saxon, Scripps-Booth and Studebaker, Detroit; General Motors Truck Co., Pontiac; Reo Motor Car Co., Lansing; Buick and Chevrolet Motor companies, Flint, and Nordyke & Marmon Co.

—

Moline Plow Co. Earns 9.14 Per Cent

MOLINE, ILL., Jan. 28—The Moline Plow Co., having changed its fiscal year, has issued its report for the fifteen months ending Oct. 31, 1918. Net profits are $2,038,779, after deducting all operating expenses, allowing for depreciation of fixed assets, for interest on borrowed money and for bad debts.

Deny Labor Surplus Reports

Congressmen Point Out Condition Is Temporary—Suggest Propaganda

WASHINGTON, Jan. 27—Congress will devote much time this week to the labor situation, and is expected to pass Senator Kenyon's bill providing $100,000,000 as an emergency fund to start public works to employ those now unemployed.

Reports of labor surpluses at various sections of the United States were denied in Congress last week by a number of Congressmen. The surplus of labor reported by the Department of Labor as existing in the State of Washington was said to be actually a result of a strike and this, it was stated, could not be called a real surplus. Youngstown, Ohio, and other points reported as having large surpluses of workers and being in serious condition by the Department of Labor, were said by Congressmen to be in much better condition than reports indicated.

The fact that Congress has held up the payment of informal contracts is regarded as a very important reason for whatever unemployment exists. Employers, it was said, waiting for their payments from the Government on war contracts, planned to use these funds for engaging in normal peace time production and are unable to take on workers until they are paid.

There are also reports that the official statement indicating labor surpluses and similar announcements from organized labor form a propaganda in part designed to secure future army wages for discharged soldiers and also in part to slacken the demobilization and thereby maintain labor shortage and consequently the war wage standards.

—

Consider Validating Measure

(*Continued from page* 274)

rectly, and receive no compensation, save and except such per diem compensation as shall be fixed by the commission. Whenever the commission shall refer to any such regional board of examiners any claim they shall proceed informally to hear the parties, take the proofs, and return the same promptly to the commission with their recommendation thereon.

"Sec. 8. That the sum of $50,000, or so much thereof as may be necessary, is hereby appropriated, out of any money in the Treasury not otherwise appropriated, for the reasonable expenses of said commission, to be paid out upon the warrant of the chairman, who shall be chosen by the commission from among their own members, and approved by the secretary, who may be selected by the commission, and who shall receive a salary of not exceeding $5000 for the period of 1 year, or so much thereof as may be necessary, to be determined by the commission."

Amend the title so as to read: "A bill to legalize informal or defective orders for war supplies and materials: to provide for the cancellation of orders and contracts, for the reimbursement of contractors and manufacturers, for the adjustment of claims on canceled contracts or orders, to provide for the partial payment of awards pending final determination, and for the creation of an adjustment commission."

Following is the amendment suggested by Senator Pomerene for the protection of subcontractors:

"Whenever, under the provisions of this act, the Secretary of War shall make an award to any prime contractor who shall have sublet any part of said contract for material, equipment, or supplies to any other person, firm, or corporation who has in good faith made expenditures, incurred obligations, rendered service, or furnished material, equipment, or supplies to any prime contractor, with the knowledge and approval of any agent of the Secretary of War duly authorized thereunto, the Secretary of War shall apportion the amount of said award justly due to each of the subcontractors of said prime contractors. Before payment of said award the Secretary of War shall require any prime contractor to present satisfactory evidence of having paid said subcontractors or of the consent of said subcontractors to look for their compensation to said prime contractor only; and in the case of the failure of said prime contractor to present such evidence or such consent, the Secretary of War shall pay directly to said subcontractors the amount found to be due under said award; and in case of the insolvency of any prime contractor the subcontractor of said prime contractor shall have a lien upon the funds arising from said award prior and superior to the lien of any general creditors of said prime contractor."

—

Standard Parts Back to Peace Plan

CLEVELAND, Jan. 29—In placing its operations on a peace-time basis, the Standard Parts Co. has reinstated the plan of separate general management for its various plants. This method replaces the centralizing of all activities in the general offices which was made necessary in order to conserve man power during the war and especially during the time when a great part of all production was for one customer, viz, the Government. The executive and supervisory offices, credits, collections, disbursements and contracting for the larger material supplies will remain in the general offices.

The several plants will be under general managers as follows: Standard Welding plant, H. H. Newsom; Perfection Spring plant, F. F. Grimmelsman; Bock Bearing plant, George H. Kleinert; American Axle and Cincinnati Axle plants, both producing Stan-Par Axles, D. K. Moore, with headquarters in Cleveland; Canton Spring and Canton Forge plants, J. B. Childe; Connersville Spring and Axle and Wheeling Axle plants, E. V. Overman, with headquarters in Cincinnati; Pontiac Spring plant, B. A. Litchfield; Flint Spring plant, R. T. Armstrong; St. Louis Spring plant, N. B. Champ; Perfection Heater plant and Spring Jobbing division, B. R. Winborn.

—

Harry S. Harkness is Dead

NEW YORK, Jan. 24—Harry S. Harkness, formerly president of the Sheepshead Bay Speedway Corp., died last night at his home in this city. He was 38 years old. Mr. Harkness was one of the first automoblie owners to drive his own car in races, and competing against a number of the wealthy owners who in earlier days drove their own cars in contests. He was also a pioneer aviator.

—

Kentucky Wagon Buys Dixie

LOUISVILLE, Jan. 28—The Kentucky Wagon Manufacturing Co. has purchased the Dixie Motor Car Co. and is preparing to materially increase the production of Dixie cars. The Kentucky company manufactures Old Hickory motor trucks.

Reports Show Labor Surplus

U. S. Employment Service Says 25% of Cities Report Shortage; 60% a Surplus

WASHINGTON, Jan. 27—Labor conditions, according to reports from the Department of Labor, are serious and growing more so. The United States Employment Service of the Department of Labor, which has for several weeks insisted that there is a labor surplus and a consequent unemployment, despite contrary reports from many localities, states that 25 per cent of the cities reported shortages of labor, 60 per cent that the supply equals the demand, and 12½ per cent a surplus of labor on Dec. 10, 1918.

From that date until the current week, says the department, there has been a steady decrease in shortage and an increase in surplus reported, and telegraph reports during the current week indicate that 13 per cent of the cities have a shortage of labor, 44 per cent have a surplus and 43 per cent have a supply equal to the demand. On Dec. 21, six States reported a surplus of labor, according to the statement, and during the current week twenty States reported a surplus.

On Dec. 3, there was a total shortage of labor of 34,000 reported and a surplus of 12,000, and during the following eight weeks this shortage was reduced to 12,000 and the surplus increased to 210,000.

New England reports indicate a surplus in practically every center. New York State reports a surplus of labor in every large city. New Jersey reports a supply equal to the demand. Pennsylvania reports indicate shortages of labor everywhere except at Erie, which has a heavy surplus. Ohio has a surplus of labor totalling 55,000 in Cleveland, 10,000 in Toledo and 7000 in Dayton.

The Middle West reports a surplus of 30,000 workers at Detroit, 4400 at Indianapolis and 400 at Minneapolis, with surpluses reported from most every other point. There is a slight demand for machinists. The copper districts are suffering serious conditions. Copper producers are unable to market their total outputs, and are laying off workers. Nebraska reports a shortage of workers.

In the South there is some demand for miners and agricultural help, while Savannah, Ga., reports shortage of mechanics, ship yard workers, and Delaware, Kentucky and Virginia have shortages of machinists and ship yard workers. Tennessee, North Carolina and Florida are suffering from a surplus.

—

More Import Restrictions Lifted

WASHINGTON, Jan. 29—Restrictions upon the importation of pyrites, graphite, plumbago and graphite crucibles have been removed by the War Trade Board and licenses will now be issued freely.

Overland to Divide Profits with Men

Capital and Labor Will Split 50-50 After Provision for Wages and Normal Profits

TOLEDO, Jan. 27—A profit sharing plan whereby the Willys-Overland Co. will divide profits equally between capital and labor after wages and normal profits in relation to the capital invested are taken out was announced by John N. Willys at a meeting of the foremen of the plant held to-day.

The profit sharing plan will be retroactive to Jan. 1, 1919, and the wage scales in effect from time to time will not be affected. Mr. Willys' statement, in part, follows:

"After permanent capital and permanent labor have each been justified, having due regard to the cost of each, the cost of capital and the cost of living, then the additional profits accruing from the joint employment of permanent capital and permanent labor shall be divided between them, 50-50. The detailed plan, when ready to present, will recognize and reward individual efficiency, departmental efficiency and increasing reward for continuous service, and these plans will have no influence on periodical adjustment of wages."

It is understood that every employee of the Willys-Overland factories will be affected and that if the plan proves satisfactory in operation it will be extended to the subsidiary plants.

—

Two Official Entries for Indianapolis Race

NEW YORK, Jan. 27—Two official entries have been received for the 500-mile Liberty sweepstakes on the Indianapolis Speedway on May 31. R. C. Durant will drive a Chevrolet special model, and Ralph Mulford will drive a Frontenac. Opening races on the Uniontown, Pa., speedway have been sanctioned for May 17.

—

19,500 Ft. Altitude Record for Monoplane

WASHINGTON, Jan. 25—A record for altitude in a monoplane has been made by Major R. W. Schroeder. The War Department received a telegram yesterday from the commandant at McCook Field, Dayton, that Major Schroeder, with two passengers, in a monoplane climbed to a height of 19,500 ft. in 31 minutes. With him were Lieutenant George V. Elsy and K. A. Craig, a mechanician. The previous record for a machine of this type is said to be about 16,000 ft. The plane was built by Grover C. Loening of Long Island City, N. Y., and was powered with an 8-cylinder engine. It has developed a speed of 145 m.p.h.

—

Aviation Secretary for Cabinet

Creation of Air Bureaus Suggested to Develop Mechanical Flight in U. S.

WASHINGTON, Jan. 23—Creation of a separate air department, with its head a member of the Cabinet, was advocated yesterday by Senator Chamberlain of Oregon, chairman of the Senate Military Affairs Committee, in a statement in which he expressed the belief that the control of the air would "unquestionably be the decisive factor in the next war, overshadowing in importance the forces on either land or sea."

"The United States," said Senator Chamberlain, "ought to profit by the experiences of the war with Germany and formulate a constructive program accordingly. We ought to continue to manufacture airplanes in reasonable quantities, but, more than all, we should endeavor to develop mechanical flight, so as to be able, should the emergency arise, to maintain control of the air.

"The air problem in the future seems to rest on efficient co-ordination. It is for this reason that we—speaking for a majority of the members of the Senate Military Affairs Committee—recommend a unification of effort and still urge such a policy. What I would like to see would be the creation of a separate air bureau or department, whose head shall sit in the cabinet along with the Secretaries of War and Navy."

—

Platinum Imports

WASHINGTON, Jan. 27—Imports of platinum into the United States during the year ended June 30, 1918, totaled 48,745 troy ounces unmanufactured, and 3117 ounces of ingots—bars, plates, etc. Following is a table showing the imports by countries of origin:

From—	Unmanufactured—Troy ounces.	Unmanufactured—Value.	Ingots, bars, plates, etc.—Troy ounces.	Ingots, bars, plates, etc.—Value.	Vases, retorts, Value.
France	166	$18,142	814	$78,674	....
Netherlands	....	....	....	....	$165
England	1,073	80,834	357	29,614	....
Canada	76	7,249	253	23,671	1,682
Panama	372	35,254	....	....	....
Mexico	9	749	....	....	....
Cuba	....	....	3	260	....
Brazil	27	2,312	....	....	....
Chile	3	300	....	....	....
Colombia	25,365	2,112,211	1,665	129,533	700
Peru	3	300	....	....	....
Venezuela	162	12,960	....	....	....
China	489	38,207	....	....	....
Russia in Asia	21,000	2,000,000	....	....	....
British South Africa	....	....	25	2,344	....
Totals	48,745	$4,308,518	3,117	$264,096	$2,547

Commercial Airplane Tests Permitted

Use of McCook Field by Companies or Individuals Authorized by War Department

WASHINGTON, Jan. 27—Peace-time development of aircraft was given an impetus to-day when the War Department authorized the use of McCook Field, Dayton, Ohio, for testing of experimental planes by individuals or private companies. The regulations provide that all unofficial tests will be at the owners' risk and expense and after examination of the planes by army experts to determine the safety of the trials in the air.

Official tests will also be conducted at McCook Field by Army pilots experienced in experimental work. Owners desirous of having official tests made must submit two planes, one for destruction tests and one for performance. The Government will defray the expenses of official tests.

Following are the complete regulations applying to both private and official tests:

1. The Chief of the Technical Section is charged with the responsibility for all tests of experimental airplanes at Air Service fields.
2. Such tests will be conducted at McCook Field, Dayton, Ohio, unless otherwise permitted by the Director of Military Aeronautics.
3. Such tests will be entirely at the owner's risk and expense, and he shall supply the pilot therefor. No Air Service pilot will be permitted to engage in these tests.
4. Flight tests will be permitted only after a technical examination by a representative of the Technical Section. If, in the opinion of this officer, the airplane is unsafe to fly, no flight will be permitted at an Air Service field.

Official tests of experimental planes will be authorized only at McCook Field, Dayton, Ohio, and under the following conditions:

1. The owners of such airplanes must submit 2 models—one for destruction test and one for performance test.
2. Tests will be at Government expense and the flight test will be made by an Army pilot detailed by the Chief of the Technical Section.
3. Flight tests will be permitted only after a technical examination and sand-test by a representative of the Technical Section. If, in the opinion of this officer, the airplane is unsafe to fly, no flight will be permitted at an Air Service Field.

Pilots unexperienced in flying experimental airplanes will not be permitted to fly such planes until after they have been placed "in production."

Commanding officers at Flying Fields will be held strictly responsible that no flights are made at their fields in violation of the foregoing instructions.

—

Civilian Flying Unrestricted

WASHINGTON, Jan. 24—The Joint Army and Navy Board on Aeronautic Cognizance has removed restrictions on civilian flying, and will grant permits to all qualified civilians who apply under the President's proclamation of Feb. 28, 1918.

Until the action of the Joint Army and Navy Board on Aeronautic Cognizance, civilians were only permitted to fly experimental machines and then only under permits from the Board.

Applications from civilian pilots should be addressed to the Joint Army and

Navy Board on Aeronautic Cognizance, Building "D," Sixth and B Streets, N. W., Washington, D. C., Lt. L. G. Haugen, A. S. A., Secretary.

—

Cars and Trucks Only for Omaha Show

OMAHA, Jan. 28—Omaha's fourteenth annual show will be an exhibit of passenger cars and trucks only, and will be bigger than any in the past.

The show is set for March 10-15. It will be staged in the Auditorium, a building occupying half a block, and affording one floor and a small basement. To this the directors of the Omaha Automobile Trade Association have decided to add the McCaffrey-Ford Building adjacent, which gives a quarter of a block more space, and possibly the building of Andrew Murphy & Son, comprising the remaining quarter block. Part of the McCaffrey Building was utilized last year.

Thus the whole show, with more floor space than ever before, will yet be housed in a single, solid block. But no tractors or accessories will be shown, unless it is by the enterprises of the individual dealers in their separate showrooms.

—

$300,000,000 for Road Improvements

WASHINGTON, Jan. 27—About $300,000,000 will be put into road building this year, according to estimates by experts of the Department of Agriculture, submitted to the Division of Public Works and Construction Development of the Department of Labor. It is understood that about half this amount will go to labor.

The $300,000,000 of construction estimated will not be sufficient to make up deferred war construction, it is believed, for normally the amount spent on roads in the United States is not far below $300,000,000. During the war road building almost came to a stop in many states.

Estimates prepared for the following States are considered accurate within one or two per cent, according to officials of the Department of Agriculture: Maine, $1,500,000; Rhode Island, $90,000; Connecticut, $4,000,000; New York, $12,000,000; New Hampshire, $175,000; Kentucky, $1,500,000; Alabama, $1,000,000; West Virginia, $16,000,000; Illinois, $9,000,000; Iowa, $15,574,000; Louisiana, $4,674,000; Texas, $20,000,000; Nebraska, $1,657,089.07; North Dakota, $3,000,000; Wyoming, $653,000; Colorado, $3,900,000; California, $20,000,000; Arizona, $900,000; Nevada, $1,148,849.80; Idaho, $1,000,000. New Jersey, Maryland and Montana are expected to make considerable expenditures on roads this year.

—

Increase Road Cost Limits

WASHINGTON, Jan. 27—The House Committee on Roads yesterday favorably reported a bill increasing the limit of cost of roads to be built with Federal aid from $10,000 to $15,000 per mile.

This action was taken to permit the various States to proceed with projects stopped by the Government's fixing the limit to be paid for construction at a figure at which no contracts could be placed.

"The construction of public works," said the report, "is recognized throughout the country as one of the means for solving the questions of unemployment due to cessation of the production of materials required for carrying on the war."

Road Builders Meet in New York

Will Discuss Efficient Methods of Road Building and Maintenance Feb. 25-28

NEW YORK, Jan. 25—The Ninth American Good Roads Congress and the Sixteenth Annual Convention of the American Road Builders' Association will be held at the Hotel McAlpin, Feb. 25-28. It is planned to devote Feb. 25 and 26 to the presentation and discussion of papers and the 27th and 28th to the consideration of reports of committees. The business session will be held on the afternoon of Feb. 28, and the annual banquet on the evening of the 26th or 27th. It is proposed to show motion pictures pertaining to highways on two evenings during the congress.

Among the subjects to be discussed are:

National Highways and Federal Aid for State Highway Improvements.
Relation of Highways to Railways and Waterways.
Efficient Methods of Contracting for Highway Work During the Reconstruction Period.
Efficient Methods of Promoting Highway Bond Issues.
Efficient Methods of Drainage for Different Geological Conditions.
Foundations for Heavy Horse-Drawn and Motor Truck Traffic.
Methods of Maintaining Highway Systems Prior to Construction by the State or County.
Economic Utilization of Labor Saving Machinery.
Cost Keeping for Highway Contractors.
Street Systems, Their Relation to Highways Outside of Urban Districts.
The Efficiency of the French Broken Stone Roads During the War.
Efficiency of Bituminous Surfaces Under Motor Truck Traffic.
Recent Developments in the Construction, Maintenance and Reconstruction of Cement Concrete Pavements.
Present Status of Brick Pavements Constructed with Sand Cushions, Cement Mortar Beds and Green Concrete Foundations.
Recent Practice in the Construction of Stone Block Pavements.

Committees will submit reports on the following subjects:

Regulations Covering Speed, Weight and Dimensions of Motor Trucks.
Methods of Financing Highway Improvements for States, Counties and Towns.
Civil Service Requirements for Highway Engineering Positions.
Sources of Supply of Unskilled Labor for Highway Work.
Convict Labor on Highway Work: Organization, Administration, Camps and Cost Data.
Reconstruction of Narrow Roadways of Truck Highways with Adequate Foundations and Widths for Motor Truck Traffic.
Methods of Strengthening and Reconstructing Highway Bridges for Heavy Motor Truck Traffic.
Efficient Methods of Snow Removal from Highways Outside of Urban Districts.
Guarantees for Pavements on Roads and Street.
Uniform Highway Signs.

Because of the war, it was decided to postpone the exhibit of road machinery, equipment and materials until next year.

—

Good Roads Chairmen Appointed

LANSING, Jan. 24—The executive committee appointed by Governor Sleeper to arrange for establishing rural motor truck routes in every county in the state met Wednesday, Jan. 22, and adopted a resolution favoring the senate bill for amending the state constitution to allow state appropriations for good roads. The following chairmen of counties were appointed:

Ottawa, Nathaniel Robbins, Grand Haven; Kent, Fred A. George, Grand Rapids; Ionia, M. Chapman, Ionia; Muskegon, S. H. Klink, Muskegon; Newago, J. B. John, Newago; Montcalm, F. E. Runney, Greenville; Osceola, A. R. Davey, Evart; Oceana, Thomas Reed, Shelby; Mecosta, George F. Fairman, Big Rapids; Mason, C. H. Curtis, Ludington; Lake, G. F. Duffey, Baldwin; Manistee, R. M. Hoffman, Manistee; Wexford, Henry M. Knowlton, Cadillac; Missaukee, Henry Curtis, Jennings; Benzie, J. H. Hoffstetter, Frankfort; Kalkaska, J. H. Greacen, Kalkaska; Grand Traverse, F. H. Hamilton, Traverse City; Leelanaeu, D. H. Day, Glenhaven; Charlevoix, Harry Nichols, Charlevoix; Emmett, A. L. Deuel, Harbor Springs; Sheboygan, H. A. Frombach, Sheboygan; Antrim, E. R. Harris, Ellsworth; Otsego, S. W. Buck, Gaylord; Crawford, T. W. Hansen, Grayling.

—

National Highway Conference Invitation

NEW YORK, Jan. 25—A conference on "Regulations Covering Speed, Weight and Dimension of Motor Trucks" will be held under the auspices of the National Highway Traffic Association at the Automobile Club of America, 247 West Fifty-fourth Street, at 8 p. m. on Friday, Jan. 31. An informal dinner, at $1.50 a cover, will be served in the grill room of the club at 6.30 p. m. Those interested should address Secretary Elmer Thompson, 247 West Fifty-fourth Street.

—

No Truck Show for Boston

BOSTON, Jan. 25—Manager Chester I. Campbell has announced that there will be no commercial vehicle show here this year unless something unforeseen develops. The basement of Mechanics' Building is filled with goods which it was believed belonged to the government. When an appeal was made to the Federal officials to move the stuff and an investigation was made, it was found that the things were owned by the Quincy Market Cold Storage Co. of Boston. And as the owners of Mechanics' Building are getting a big rent for the basement they are not in any hurry to get rid of the goods to accommodate the automobile association. One last effort is being considered, that of appealing to the Boston Chamber of Commerce, to try to have that body interest the owners to remove the goods, but it is not believed that this will be successful.

—

Muskegon Holds Third Annual Show

MUSKEGON, Mich, Jan. 27—Muskegon will hold its third annual show at the same time Detroit is staging its exhibition, March 3-8. It will be under the auspices of the Elks Lodge and will be held in the armory, which has a floor space of 10,000 sq. ft.

—

Shipping Space for Commercial Exports

WASHINGTON, Jan. 28—The British Government has allocated 10 per cent of all space on liners for commercial shipments. There are prospects for early release of additional space.

Detroit Hears Talk on Patents

Attorney for Standard Parts Co. Gives S. A. E. Comprehensive Summary of Laws

DETROIT, Jan. 25—Addressing the Detroit section of the Society of Automotive Engineers at their meeting last night, B. M. Kent, patent attorney for the Standard Parts Co., gave a comprehensive summary of the patent laws. He outlined the procedure necessary to secure a patent, and declared that a great deal of the trouble incurred by inventors and manufacturers in connection with the purchase of patents would be eliminated were Congress to grant the Patent Office at Washington a reasonable working appropriation instead of curtailing its budget to a minimum.

To this end, he suggested that the S. A. E. get behind a movement to secure for the Patent Office an individual appropriation, separate from that of the Department of the Interior, under whose jurisdiction it is conducted. He further declared that the Patent Office employees were insufficiently paid and that the Government was unable to secure expert legal and engineering advice because first class men would not work for the meager salaries offered.

In his address Mr. Kent dealt with the laws governing the granting of patents, commencing with the definition of a patent, the rights granted and their limitations in actual fact. He referred to the matters of prior patents, research, etc., and to the advantage of maintaining a file of the classes of patents relating to individual businesses or manufacturers, to the definition of a person eligible, by reason of his discovery of a new and useful art, etc., to have a patent granted him and to the formal manner in which application for such patent should be made.

—

Experiments on Flame Propagation

(*Continued from page* 248)

losses of heat, the combustion products are not in thermal equilibrium. Hopkinson showed, in 1906, that the temperature round the point of ignition may be several hundred degrees higher than the mean temperature (as reduced from the pressure), owing to adiabatic compression there, while near to the walls the temperature was much below the mean. Wheeler's pressures first rose rapidly, then kept constant for a short period, and finally dropped off owing to cooling. The period of constancy might be ascribed to a combustion in several stages and to exothermic secondary reactions between CO and steam; but the size of the vessel is of importance in this connection, and from Wheeler's experiments, some of which were made with a fan revolving in the mixture, the constancy period seems to be due rather to the equalization of temperature within the gaseous mass. The time of first manifestation of pressure does not synchronize with the ignition moment. There is a time-lag (as Bairstow and Alexander had shown in 1905), and disregard of this fact may account for the high flame propagations stated by Le Chatelier. Wheeler observed that when the flame traveled at the rate of 28 cm. per second in a 6.3 per cent mixture, the time-lag (between ignition and first appearance of pressure) amounted to 0.18 second, and the maximum pressure developed within 0.348 second. That was in the 4-litre vessel. In the 16-litre vessel a flame of 15 cm. velocity took 0.423 second and 1.037 second for the two periods. Owing to this time-lag the flame will actually travel about 5 cm. in the small vessel and about 10 cm. in the large vessel before setting up any noticeable pressure, which is rather curious. The pressures were registered by means of a style fixed to a steel plate 2.6 cm. in thickness; ignition was by electric sparks.

—

Car Market Drained in 1918

(*Continued from page* 270)

472, of which 18,808 were delivered, 19,649 canceled, 7904 shipped overseas and but 15 remain to be delivered.

No motor trucks now overseas will be returned to this country, and but few of the trucks in the hands of the Army in this country will be offered for sale to the public, states the letter.

Following is the complete letter:

37 of 38 Jobbers Go Before Jury

Court Decides They Must Put in Defence—Case Against One Is Dismissed

NEW YORK, Jan. 28—Thirty-seven of the thirty-eight defendants in the suit brought by the Government against the Jobbers' Association will have to put in a defence and abide by the verdict of the jury. Judge Hand decided this to-day, and in doing so dismissed the case against the thirty-eighth, who is J. Stanley Clemence of Ballou & Wright.

The action of the court was a little surprising in view of the aspect of the situation up to this afternoon. It would not have been surprising if the cases against the entire thirty-eight had been dismissed. Yesterday saw the start of the taking of evidence before the jury.

—

Motorize New Zealand Post Office

WASHINGTON, Jan. 23—The Post and Telegraph Department of New Zealand has been allowed $48,665 for motor cars, motorcycles and bicycles for the use of that department. The Department of Mines has been allowed $65,698 to develop the mineral-oil industry of the country.

WAR INDUSTRIES BOARD
WASHINGTON

B. M. BARUCH
Chairman

In Your Reply
Refer to.....

From: Chief, Automotive Products Section.
To: Passenger Car and Motor Truck Manufacturers.
Subject: **Passenger Car and Motor Truck Data.**

1. Manufacturers' Reports submitted to this section supply information which will be of general interest.

2. **TOTAL PASSENGER CAR PRODUCTION.**

1917	1918
1,740,792	926,388

Sworn Reports received from the Passenger Car Manufacturers as of December 31, 1918, show that the Manufacturers had an aggregate of 15,545 finished Passenger Automobiles on hand. This represents only about three days normal production.

3. **TOTAL MOTOR TRUCK PRODUCTION.**

	1917	1918	Proposed 1919
For civilian use	109,865	164,264	
For military use	18,292	62,986	
	128,157	227,250	327,930

DISTRIBUTION OF PROPOSED PRODUCTION FOR 1919.

½ ton	9,300	2 tons	49,947	4 tons	1,149
¾ ton	30,043	2½ tons	10,063	5 tons	16,992
1 ton	138,738	3 tons	6,155	5½ tons	1,000
1½ tons	43,308	3½ tons	19,212	6 tons	1,069
				7½ tons	954

A sheet showing distribution in price retail has been previously mailed to all contributing manufacturers.

The large increase in production of Motor Trucks during 1918 for civilian use may be attributed in part to indirect war demand. It will be noted that the manufacturers in the aggregate propose to greatly increase production for 1919.

The proposed production figures for 1919 were supplied by the manufacturers after the signing of the Armistice.

4. **SUMMARY OF U. S. GOVERNMENT MOTOR VEHICLES AS OF JAN. 1, 1919.**

	Total Ordered	Total Delivered	Total Canceled	Balance Due	Shipped Overseas
Trucks	204,760	*98,000	78,081	28,679	54,343
Pass. cars	38,472	18,808	19,649	15	7,904

*Includes foreign purchases.

In December the Post Office Department made requisitions on the War Department under the Act of July 2, 1918, for 17,135 Motor Trucks, mostly from ¾ to 2-ton sizes.

5. From the best information available, it is the opinion of this section that none of the Motor Vehicles now overseas will be returned to this country and we have reason to believe that few, if any, of the Motor Vehicles in the hands of the military establishment in this country will be offered for sale to the public.—C. C. Hanch.

P.S.: Fnished trucks, including those for military use, in the hands of the manufacturers on December 31, 1918, represent only about fifteen days normal aggregate truck production.

AUTOMOTIVE MATERIALS MARKETS

Materials Market Prices

Acids:
Muriatic, lb. ..... .02 -.03
Phosphoric (85%). .35 -.39
Sulphuric(60%),lb. .008

Aluminum:
Ingot, lb. ..... .33
Sheets (18 gage or more), lb. ..... .42

Antimony, lb. ..... .07½-.07¾

Burlap:
8 oz., yd..... .10½
10½ oz., yd..... .16½

Copper:
Elec., lb. ..... .23
Lake, lb. ..... .20 -.23

Fabric, Tire (17¼ oz.):
Sea Is., combed, sq. yd. 1 62
Egypt, combed, sq. yd. 1.30
Egypt, carded, sq. yd. 1.27
Peelers, combed, sq. yd. .97
Peelers, carded, sq. yd. 95-1.05

Fibre (⅛ in sheet base), lb. ..... .50

Graphite:
Ceylon, lb. ..... .09 -.22
Madagascar, lb. .. .10 -.15
Mexico, lb. ..... .03¾

Lead, lb. ..... .05 -.055

Leather:
Hides, lb. ..... .18 -.35¼

Nickel, lb. ..... .40

Oil:
Gasoline:
Auto. gal. .... .24½
68 to 70 gal.... .30½
Lard:
Prime City, gal.1.90-2.00
Ex. No. 1, gal..1.10
Linseed, gal. 1.58-1.59
Menhaden (Dark), gal. 1.10-1.12
Petroleum (crude):
Kansas, bbl. ..2.25
Pennsylv'a, bbl..4.00

Rubber:
Ceylon:
First latex pale crepe, lb. .... .54
Brown, crepe, thin, clear, lb. .... .48 -.49
Smoked, ribbed sheets, lb. ... .52
Para:
Up River, fine, lb. 58½
Up River, coarse, lb. ..... .34
Island, fine, (lb.) .49

Shellac (orange) lb. .70 -.72

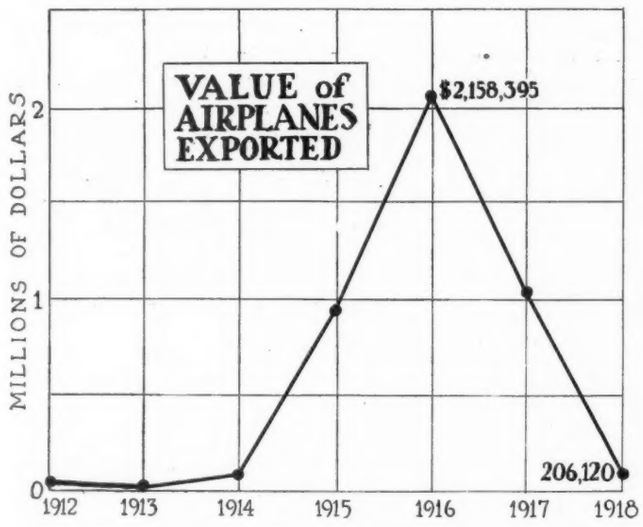
Spelter ..... .07 -.08

Steel:
Angle beams and channels, lb..... .03
Automobile sheet (see sp. table.)
Cold rolled, lb.... .0625
Hot rolled, lb..... .039

Tin ..... .71 -.72

Tungsten, lb. 1.50-2.10

Waste (cotton), lb.. .12¾-.17



Our exports of airplanes during the past seven years are more extensive than usually supposed, particularly when it is taken into consideration that the figures do not include planes sent overseas for war

AUTOMOBILE SHEET PRICES

(Based on No. 22 Gage. Other gages at usual differentials)

	Primes only per 100 lbs.	Primes when seconds up to 15 per cent are taken per 100 lbs.
Automobile body stock.....	$5.95	$5.85
Automobile body stock, deep stamping.	6.20	6.10
Automobile body stock, extra deep stamping	6.45	6.35
Hood, flat, fender, door and apron, or splash guard stock.....	6.05	5.95
Crown fender, cowl and radiator casing, extra deep stamping.....	6.55	6.45
Crown fender, cowl and radiator casing, deep stamping	6 30	6.20

Automobile Sheet Extras for Extreme Widths:
Nos. 17 and 18 over 36 in. to 44 in., 10c. per 100 lb.
Nos. 19 and 21 over 36 in. to 44 in., 30c. per 100 lb.
Nos. 22 to 24 over 26 in. to 40 in., 40c. per 100 lb.
Nos. 22 to 24 over 40 in. to 44 in., 80c. per 100 lb.

Black Sheet Extras to Apply to Narrow Widths:
Oiling, 10c. per 100 lb.
Patent leveling, 25c. per 100 lb.
Resquaring, 5 per cent of gage price after quality, finish and size extras have been added.

Seconds 10 per cent less than the invoice Pittsburgh price for corresponding primes.

Automotive Securities on the Chicago Exchange at Close Jan. 25

	Bid	Asked	Net Ch'ge
Auto Body Company.....	6½	8½	..
Briscoe Motor Car, com.....	11	..	..
Briscoe Motor Car, pfd.....	40	55	..
*Chandler Motor Car.....	102	104	—1
Chevrolet Motor Car.....	149	151	—5
Cole Motor Car Co.....	90	105	..
Continental Motors, com.....	7	8	—1
Continental Motors, pfd.....	94	97	..
Edmunds & Jones, com.....	19	22	..
Edmunds & Jones, pfd.....	75	90	..
Electric Storage Bat.....	50	55	..
Federal Motor Truck.....	32	35	..
Fisher Body Co., com.....	36½	42	..
Fisher Body Co., pfd.....	92½	93¾	..
Ford Motor of Canada.....	250	260	+5
General Motors, com.....	125	126	+2
General Motors, pfd.....	82½	84½	—1¼
Hupp Motor Car, com.....	5½	6½	—¾
Hupp Motor Car, pfd.....	89½	..	+3
Kelsey Wheel Co., com.....	30⅛	34½	..
Kelsey Wheel Co., pfd.....	86	90	..
Manhattan Electric S., com..	..	48	..
Maxwell Motor, com.....	26½	27½	—¾
Maxwell Motor, 1st pfd.....	51½	52½	+¼
Maxwell Motor, 2nd pfd.....	19½	20½	..
McCord Mfg., com.....	32	35	..
McCord Mfg., pfd.....	93	96	..
Mitchell Motor Co.....	24	30	..

	Bid	Asked	Net Ch'ge
Motor Products Corp.....	35	41	—5
Nash Motors Co., com.....	160	175	..
Nash Motors Co., pfd.....	93½	97	+3½
National Motor Co.....	6	10	..
Packard Motor Car, com....	115	..	+3
Packard Motor Car, pfd.....	100	..	..
Paige-Detroit Motor, com...	23	24	—1
Paige-Detroit Motor, pfd....	8¾	9¾	..
Peerless Motor Truck.....	18	21	..
Pierce-Arrow Mot. Car, com.	39¾	40¾	+¼
Pierce-Arrow Mot. Car, pfd.	101¾	102	..
Premier Motor Corp., com...	5	..	..
Premier Motor Corp., pfd...	..	75	..
Prudden Wheel Company...	15½	17½	..
Reo Motor Car Co.....	21¼	22¼	—¼
Republic M. Truck, com.....	38	40	+3
Republic M. Truck, pfd.....	87	90	..
Saxon Motor Car, com.....	6¼	8¼	—½
Scripps-Booth Corp.	21	25	..
Stewart Warner Speed. Corp.	86½	88½	—⅞
Stromberg Carburetor Co...	33	38	..
Studebaker Corp., com.....	49⅛	50⅛	+1⅛
Studebaker Corp., pfd.....	92½	97	..
Stutz Motor Car Co.....	49	50	—½
United Motors Corp.....	34¼	36¼	—⅝
White Motor Co.....	44¾	45¾	—½
*Willys-Overland, com.	24⅛	25⅛	+⅛
Willys-Overland, pfd.	88¼	88⅞	..

RUBBER STOCKS

	Bid	Asked	Net Ch'ge
Ajax Rubber Co.....	70¾	71	..
Firestone T. & R., com.....	145	150	+5
Firestone T. & R., pfd.....	95½	100	..
Fisk Rubber Co., com.....	89	91	+5
Fisk Rubber, 1st pfd.....	97	100	..
Fisk Rubber, 2nd pfd.....	85	90	..
Fisk Rubber, 1st pfd. conv..	100	105	..
Goodrich, B. F., com.....	58	59	—3
Goodrich B. F., pfd.....	102	103½	+1
Goodyear T. & R., com.....	230	235	..
Goodyear T. & R., 1st pfd...	104	105½	—½
*Goodyear T. & R., 2nd pfd..	103	105	..
Kelly Springfield, com.....	70	71	—1
Kelly Springfield, 1st pfd....	90	100	..
Lee Tire & Rubber Co.....	21¼	22	—¾
Marathon Tire & Rubber.....	..	55	..
Miller Rubber Co., com.....	142	148	..
Miller Rubber Co., pfd.....	96	98	..
Rubber Products Co.....	114	118	..
Portage Rubber Co., com....	145	149	..
Swinehart T. & R. Co.....	50	60	..
U. S. Rubber Co., com.....	74½	75	—2
*U. S. Rubber Co., pfd.....	109	110	..

*Ex. dividend.

Four Men Added to F. W. D. Staff

CLINTONVILLE, Jan. 25—Four men, all recently released from government service, have been added to the Four Wheel Drive Auto Co. organization. Lt. Willetts, who was chief instructor in the Motor Training School which the government formerly maintained at the F. W. D. plant, is now a member of the F. W. D. force and will be in charge of the instruction work connected with the plant.

F. A. Da Pron and Walter Hewitt have been added to the foreign sales department. Mr. Da Pron is a constructional engineer, who, for a number of years, was associated with the engineering firm of Reed & Stern, and who for the past year has been an engineer in the air service. He is a graduate of the Boston Technological Army School. Mr. Hewitt was an army instructor in gunnery.

A. B. Parks of Elmira, N. Y., has recently joined the sales force. For the past two years he has been connected with the Curtis Aeroplane Corp., Hammondsport, N. Y.

—

Two Ex-Army Men on Staff of Standard Parts Co.

CLEVELAND, Jan. 25—Lewis P. Kalb, formerly major of design, testing and specification work in the engineering division of the Motor Transport Corps, has joined the engineering staff of the Standard Parts Co. as assistant to the director of engineering. Before entering Government service he was chief engineer of the Kelly-Springfield Motor Truck Co., and previous to that was assistant truck engineer of the Pierce-Arrow Motor Car Co.

A. L. Watts, formerly captain in charge of the specification and record section of the engineering division of the Motor Transport Corps, will assume similar duties on the engineering staff of the Standard Parts Co. Before entering service in 1917 he was with the Pierce-Arrow Motor Car Co.

—

K. K. Hoagg has been appointed engineer in the sales department of the Hyatt Roller Bearing Co., Detroit. Mr. Hoagg, who has been connected with the company since 1912, left his position as assistant chief engineer to go into government service. For 11 months he was in the engineering division of the Motor Equipment Section of the Ordnance Department, stationed in Washington and Indianapolis. Previous to this he was for 7 months assistant to the manager of the Washington office of the S. A. E.

—

L. M. Baker has been engaged as special sales engineer for the Hyatt Roller Bearing Co., Detroit. At one time he was sales manager of the United Motors Service, Inc., and previous to that was western sales manager for the Standard Steel Spring Co., Detroit.

—

I. O. Taft, recently St. Louis zone superintendent for the Maxwell Motor Car Co., has been made manager of the Mississippi Valley territory with headquarters in St. Louis.

Men of the Industry

Changes in Personnel and Position

Edwin Denby a Major

DETROIT, Jan. 24—Edwin Denby, treasurer of the Denby Truck Co., former congressman, who enlisted in the marines as a private 20 months ago, has been advanced to the rank of major. He is stationed at Beaufort, S. C., having recently returned from several months of active service over-seas. He was a former president of the Detroit Board of Commerce.

—

Justin R. Weddell, Cleveland, will be advertising manager of the Firestone Tire Co., Akron, after Feb. 1, succeeding E. S. Babcock, recently resigned. Mr. Weddell comes from the Corday & Gross Co., where he is the sales manager.

—

J. L. Hibbard, foreign sales manager of the Cleveland Tractor Co., will sail on the Adriatic, Feb. 1, for a three months' business trip in Europe.

—

W. F. Winkelman has been appointed district manager of the Hupp Motor Car Corp. for the Philadelphia district. Mr. Winkelman was special representative of the Liberty Motor Car Co. and later of the J. E. Fields Co., as sales manager.

—

J. B. Siegfried, formerly general manager of the King Motor Car Co., Detroit, has been made sales manager and assistant general manager of the Auto Wheel Co., Lansing.

—

Major Mason P. Rumney will be out of the service Feb. 14, and will return to the Detroit Steel Products Co. as assistant general manager. He has been located in Washington with the Ordnance Department.

—

Major Howard Blood, executive officer of the Aeroplane Engineering Division, hitherto located at Dayton, has just been transferred from Dayton to Detroit and is now connected with the finance division. Major Blood is a member of the Blood Bros. Machine Co., Allegan, Mich.

—

F. R. Strunk, president of the Kansas City Foundry Co., Kansas City, has entered the Coleman Tractor Corp. as works manager and treasurer.

—

H. T. Melhuish, for some years advertising manager of the Fulton Motor Truck Co., Farmingdale, L. I., is going to Philadelphia to take charge of the Fulton office in that city, succeeding M. R. Sanborne, who goes to the Kansas City office. Mr. Melhuish is a brother of William Fulton Melhuish, president and founder of the Fulton Motor Truck Co.

General Lee Returns to England

WASHINGTON, Jan. 27—Brigadier-General Charles Frederick Lee, Royal Air Force, chief of the British Aviation Mission, sails for England Feb. 8, returning to command the Training Brigade, R. F. C. General Lee has been in the United States since Nov. 30, 1917.

—

Major George D. Wilcox, who commanded the Detroit district of the Motors Division of the Quartermaster Corps, has been honorably discharged and returned to the Commerce Motor Car Co., Detroit, as director of sales and advertising.

—

A. C. Miller has resumed his duties as vice-president of the Miller-Judd Co., Liberty distributers, Detroit, after serving one year in the navy.

—

J. K. Gould, formerly advertising manager for the Ford Motor Car Co. of Canada, has been discharged from the army and has rejoined the staff of the Campbell-Ewald Co., Detroit.

—

E. V. Sidwell, former assistant manager to Edward D. Bland, manager of the Fulton Motor Truck Co. of Michigan, has been made successor to Mr. Bland, who died some time ago of influenza.

—

Glen T. Purdy, who has just returned from active service, has gone back to the King Motor Car Co., where he has been appointed assistant purchasing agent.

—

C. A. Watson, formerly a minister, has been appointed sales manager of the Four-Drive Tractor Co., Big Rapids. While pastor at Grand Ledge, Mich., Mr. Watson was distributer for the Studebaker car and also operated a machine-shop. Prior to that time, he sold Underwood typewriters and National biscuits. He was also an auditor and cashier for the U. S. Steel Co. in the Minnesota mining district. He has been a clergyman for 10 years.

—

B. F. Wulff has been appointed general sales manager for the International India Rubber Co., South Bend. He was formerly sales manager for the Century-Plainfield Tire Co., and prior to that was connected with the Kelly-Springfield Tire Co. at Chicago.

—

W. T. Horton, Jr., formerly in charge of the executive branch of the Engineering Division, Motor Transport Corps, has been appointed chief engineer of the Russel Motor Axle Co., North Detroit.

—

Sales Representative of F. W. D. Co. Dies Suddenly

W. N. Durphy, sales representative of the Four Wheel Drive Auto Co. in the Des Moines territory, died suddenly at the home of the F. W. D. dealer in Des Moines on Jan. 15. Ptomaine poisoning is supposed to be the cause of his death.

Current News of Factories

Notes of New Plants—Old Ones Enlarged

Republic to Put Out New ¾-Ton Truck

ALMA, MICH, Jan. 27—Twelve leading distributers of the Republic Motor Truck Co. met at the plant last week for an informal conference to discuss sales plans for the coming year. When the conference ended the distributers had organized the Republic Distributers' Association, chosen directors and elected officers.

The company sought the advice of the dealers relative to the proposed manufacture of a new model truck, a ¾-ton machine, and what the distributers immediately termed a "speed wagon." The matter of price-rating and specifications were taken up and led to much constructive debate.

The distributers inspected the two improved truck models, known as models 19 and 20. Both of these machines are practically the same as last season, with detail improvements. Model 19 is a 2½-ton truck. Model 20 is a 3½-ton machine. The five other standard Republic models are being manufactured as usual.

The company, while running below capacity, is completing 1000 jobs a month and will increase this as soon as the material situation clears up. The last war contract will be finished by the end of February. The contract was a big one for the manufacture of the "Class B" truck.

The Republic company is organizing agencies in Sweden, Norway, Japan, India, China, Australia, New Zealand and South America.

—

Transport Puts New 2-Ton Model on Market

MT. PLEASANT, MICH., Jan. 28—The Transport Motor Truck Co. is now entering production. The new truck is 2-ton capacity with a Clark internal gear drive, Continental engine, Eisemann magneto, duplex centrifugal governor, Stromberg carbureter, Fuller clutch and transmission mounted in the unit power plant, Columbia front axle, Jacox steering gear and Prudden wheels. The truck is mounted on a pressed steel frame.

The wheelbase is 150 in. and the truck is built in chassis form equipped with tools, jack, oil lamp, tail lamp, motometer and odometer. The truck has been on the road for several months in experimental form, and was intended to be in production by July, but owing to the material situation was held until the present time, when the production schedule has now gone into effect. The price is $2,585.

—

King Cars Ready March 1

DETROIT, Jan. 25—Reconstruction is the big problem before the King Motor Car Co. This company, which was operating 90 per cent on war contracts, was hit hard by the sudden cancellation of the contract work. The company is now rapidly getting back into passenger car production again. Assembly work is in progress, but completed cars will not be turned out before March 1. At that time production will start with five cars daily.

General Motors' Subsidiary to Finance Dealers

NEW YORK, Jan. 27—A subsidiary company incorporated under New York State laws and called the General Motor Acceptance Corp. has been formed by the General Motors Corp. to assist car and truck dealers in financing their purchases. Paid in capital is $2,000,000 and surplus is $500,000. The stock was subscribed by W. C. Durant and his associates. Paul Fitzpatrick, formerly vice-president and director of the Continental Guaranty Corp., is vice-president and general manager of the new concern. J. A. Haskell is president and Alfred H. Swayne is vice-president and financial manager.

Although the primary purpose of the new company is to finance automotive transactions, it is understood that the business in acceptances will be carried on in other directions, probably in connection with the various du Pont enterprises.

—

Ford Reopens Omaha Branch

OMAHA, Jan. 28—The Omaha branch of the Ford Motor Co. has resumed operations after being closed since last summer for an indefinite period because of war conditions.

The body department was the first to open, and when about 600 bodies have been completed the assembling department will start, which should be within a week. It is stated that the number of employees will be about 500, the same as were used before the closing, and that all former employees who so desire may have their old jobs back. Charles L. Could remains in charge as branch manager.

—

Harroun Back to Peace Time Production

DETROIT, Jan. 28—The Harroun Motors Corp., Wayne, Mich., will complete its war contract calling for the manufacture of 155 mm. shells by Feb. 1 and is getting back to a peace time production schedule. The company will run 100 cars monthly in January and February and will increase this production in March if materials come easily. Rumors that Ray Harroun, vice-president and chief engineer, had left the organization, are unfounded.

—

Receivership for Hurlburt

NEW YORK, Jan. 27—William B. Hurlburt has been appointed receiver for the Hurlburt Motor Truck Co. by the United States District Court, under bond of $25,000. The company claims assets of about $500,000 and liabilities of about the same amount.

Willys-Overland Producing 300 Cars Per Day

TOLEDO, Jan. 27—The Willys-Overland factory has increased production to a point where 300 cars per day are being turned out. January schedules call for from 6000 to 6500 cars, and it is expected that in early spring the monthly figures will run at least twice this number, or at a rate which will insure a year's output at least as high as in 1916, the last normal year. Shipments last year were approximately 82,000 cars. At the tractor end of the business, it is stated that the Moline Plow Co. branch is building from sixty to seventy-five machines per day. This figure will be increased to 125 as soon as the supply of raw material is sufficient. It is expected that 25,000 Moline tractors will be built this year.

—

Dodge 6-Cylinder Reo Rumor

LANSING, Jan. 27—Officials of the Reo Motor Car Co. do not throw additional light on the rumor current in automotive circles that the Reo company is making and will place a 6-cylinder car on the market June 1. They declare the rumor is "stock-market talk," but otherwise will neither confirm nor deny it.

The Reo Co. has finished its government tractor contract. While not running at normal capacity at present, the plant is now turning out 100 cars and trucks daily. The company expects its domestic trade to keep it too busy to cater extensively to the foreign market.

—

Studebaker Averaging 60 Cars a Day

SOUTH BEND, Jan. 27—Indications are that some of the manufacturers of motor cars may get back into production earlier than they anticipated. Word from the Studebaker Automobile Co. says that it has been able to get into after-war production thirty days ahead of schedule. At present, this concern is averaging sixty cars per day, and this figure will be increased 100 per cent by March 1. The Studebaker company expects to produce approximately 6500 cars during the first quarter.

—

Pearce Making 100 Tires a Day

ASHTABULA, Jan. 28—The Pearce Tire & Rubber Co. is now in full operation in its new plant. Officials say that within 60 days their production will exceed 100 tires daily. This will be increased gradually until the full capacity of the factory, 500 tires a day, is reached.

—

Franklin Coming Back to Normal Production

SYRACUSE, Jan. 27—The Franklin Automobile Co. is rapidly getting back to its normal manufacturing basis. Although the week following the signing of the armistice the company turned out only four cars, the production schedule for January calls for 26 cars a day. By May it will be increased to 35, by September 40, and by the end of the year it is expected that the company will produce 50 cars daily.

Contracts

WASHINGTON, Jan. 25—Following is a list of contracts made by the office of the Director of Purchase for the Bureau of Aircraft Production:

Wright Martin Aircraft Corp., New Brunswick, 13 Hispano Suiza type "E" or "I" built from rejected parts, $26,000.
Curtiss Aeroplane & Motor Corp., Buffalo, spare parts for JN4-D planes, $14.97.
Corbin Screw Corp., New Britain, miscellaneous bolts, screws, etc., $292.43.
Wright Martin Aircraft Corp., Van Dyke negatives—Hispano Suiza—1 set and bill of material, $40.
Wright Martin Aircraft Corp., New Brunswick, 6 items of special tools for Hispano Suiza type A engine, $87.90.
Wright Martin Aircraft Corp., New Brunswick, 10 No. 11894 lower half water pumps (Hispano Suiza "I" engine), $57.60.
Wright Martin Aircraft Corp., New Brunswick, repairs for Hispano Suiza engine, $1.20.
Wright Martin Aircraft Corp., New Brunswick, 36 No. 9642 Magneto gears for Hispano Suiza engines, $331.70.
Wright Martin Aircraft Corp., New Brunswick, 500 piston pin set screws, $70.
Zenith Carburetor Co., Detroit, spares for Zenith Carb., $154.
Wright Martin Aircraft Corp., New Brunswick, 8 No. 11988 pistons for Hispano Suiza type "E" engines, $120.56.
Wright Martin Aircraft Corp., New Brunswick, 100,000 No. 11169 steel cotter pins, $33.
Barber & Ross, Washington, D. C., 4 kegs nails, $17.40.
Bay State Tap & Die Co., Mansfield, Mass., 29 chasers, screw plates, and wrenches, $39.63.
John A. Roebling Son's Co., Trenton, 150 pieces balloon cable, 30 feet long, $513.

—

826 Farm Tractors in France

(*Continued from page* 271)

cultural knowledge, to enter into the tractor field.

Among other automobile firms who have announced their intention of entering the agricultural field, are Saurer, a Swiss firm, with a big factory in the suburbs of Paris; Panhard & Levasseur, one of the oldest automobile firms in the world; Renault, who possesses the biggest automobile factory in France, and Paris General Omnibus Co., which is now a producing as well as an operating concern.

In Italy, Fiat, which possesses the largest factory in Europe, has already produced an agricultural tractor and intends to considerably develop this field.

In connection with factory developments, announcement is made by Renault that in addition to passenger automobiles and tractors, he has decided to manufacture shaftings, pulleys, bearings, etc., for machine shops, as well as standardized gear sets giving four or eight speeds, to be installed on all types of machine tools enabling them to have a single driving pulley or for use with electric drive. Renault will also manufacture drills, taps and dies, wrenches and other small tools.

Although at the present moment France possesses very few tractors, the possibilities in this direction are immense. Practically the whole of the automobile service of the French Army has been handled by elderly men drawn from the agricultural classes.

France possessed 95,000 trucks and passenger cars in army service. Estimating two men per vehicle, and the regulations call for two drivers on every truck, this gives a total of 190,000 men who have had from one to four years' truck-driving experience. The artillery service has also made an extensive use of automobiles independently of the general automobile service of the army.

Thus, the total is certainly not less than 200,000 men, of which the great majority are connected with farming, who have had a thorough automobile training. All these men, on returning to civilian life, will not only be capable of taking charge of tractors, but will be anxious to use them in preference to horses, even if horses are available.

—

N. A. C. C. Truck Meeting Papers

NEW YORK, Jan. 30—Problems of the greatest importance to the motor truck industry will receive consideration at the Motor Truck Manufacturers' convention, to be held at the headquarters of National Automobile Chamber of Commerce on Tuesday, Feb 11, which is during the week of the Motor Truck Show in New York. Following are the topics:

Present Status of the Motor Truck Business—By C. A. Wales, Truck Sales Manager, Locomobile Co. of America.
The Need for Federal Highway Policies and a Federal Highway Commission—By E. J. Mehren, Editor, *Engineering News-Record.*
What Should Be the Limitation of Weights, Speeds and License Fees on Motor Trucks in the Proposed Uniform Vehicle Law—By George M. Graham, General Sales Manager, Pierce-Arrow Motor Car.
Disposition of Surplus Military Trucks Here and Abroad—By Col. Fred Glover, Quartermaster's Department, U. S. Army.
What New Standardization Can Be Done on Motor Trucks?—By David C. Fenner, International Motor Co.
What the Post Office Will Require in Motor Trucks During 1919—By James I. Blakeslee, Fourth Assistsant Postmaster General, Washington.
What Are the Opportunities for Motor Truck Sales in Europe?—By David Beecroft, Directing Editor, *Automotive Industries.*
Can We Improve the Present Standard Service and Standard Parts Policies and Guarantees?—By E. J. Herbig, Sales Manager, Service Motor Truck Company.

—

Vesper Again Heads Dealers

CHICAGO, Jan. 29—F. W. A. Vesper of St. Louis, was re-elected president of the National Automobile Dealers' Association at the close of its 2-day annual convention here to-day. One of the resolutions pledged the organization to complete co-operation with the manufacturers in the solution of reconstruction problems.

Plans were formulated for campaigns in all sections through local and state associations for the promotion of good roads. The association will take up national road aid.

The necessity for better business methods for the motor car dealer was urged by Henry Paulman, Chicago, who talked from his seventeen years of experience in the automobile business as a dealer. Why the dealer should be a factor in good roads work was told by Pyke Johnson, good roads representative of the N. A. D. A. in Washington.

Life membership was voted to W. G. Tennant, Chicago, for work in the early days of the association's development; an engrossed resolution was presented to George W. Brown, Milwaukee, for having conceived the thought which led to the formation of the organization. A silver loving cup was presented to President Vesper for his work in building the association during the period of the war. This afternoon dealers from all over made four-minute talks on business subjects. The officers follow:

President, F. W. A. Vesper, St. Louis; first vice-president, E. W. Steinhart, Indianapolis; second vice-president, Harry D. Austin, Seattle; treasurer, Thomas J. Hay, Chicago; re-elected directors, G. B. Kimball, Boston; A. E. Maltby, Philadelphia; A. E. Mitzel, Canton; George D. McCutcheon, Atlanta; J. A. Graham, Minneapolis; H. L. Robertson, Houston; P. E. Chamberlain, Denver; W. J. Brace, Kansas City; P. E. Greer, San Francisco.

The convention closed with a banquet this evening. Addresses yesterday were by George M. Graham, sales manager of the Pierce-Arrow Motor Co., on "Getting Back to Normal"; John N. Willys, president of the Willys-Overland Co., on "The Automobile Business; Past, Present and Future"; Edward S. Jordon, president of the Jordon Motor Co., on "The Automobile Dealers' Problems in Sales and Advertising." The report of the secretary gave the membership as 4475.

—

Bieler to Make "Argonne" Cars

NEW YORK, Jan. 30—Otto R. Bieler has formed the Automotive Engineering Co., with headquarters at - East Forty-second Street, and will market a 6-cylinder car which will be manufacturered for him by the Jersey City Machine Co., Jersey City. It is planned to produce 100 to 150 cars this year and to sell them for about $3,500. The car will be styled "Argonne" and will be supplied in two- and four-passenger capacities. It will have a high speed engine with a four-speed gearset, 120 in. wheelbase and 32 x 4 tires; bodies will be custom built throughout.

WASHINGTON, Jan. 25—The following orders have been placed by the Bureau of Aircraft Production:

Standard Aircraft Corp., Elizabeth, spare parts for Dh-4 planes, $36.96.
Washington Loose Leaf Co., Washington, steel bands for Proudfit binder (12), $1.80.
Western Electric Co., New York, 1,500 feet lamp cord, $111.
Barber & Ross, Washington, 24 U blocks, $66.
Starr Piano Co., Richmond, Ind., 300 boxwood toggles, $48.
James William Bryan Press, Washington, book, "Who's Who in Bureau of Aircraft Production," $7.50.
Wright Martin Aircraft Corp., New Brunswick, Hispano Suiza A-150 horsepower, engine spares, $39.49.
Willys-Overland Co., Toledo, 40 pieces, No. 3363 studs, $14.80.

—

Contracts Completed

WASHINGTON, Jan. 25—The Holt Mfg. Co., Peoria, has completed a supplemental tank for the Ordnance Department at a cost of $22,000.

The Cleveland Tractor Co., Cleveland, has completed a tractor and spare parts for the Ordnance Department at a cost of $1,405.07.

Automotive Industry of Great Aid in Winning the War

Took On Military Works, Exclusive of Trucks, Amounting to $1,000,000,000 —Curtailment of Car Production Held to Have Been Necessary

WASHINGTON, Jan. 24—That the War Industries Board policy of curtailment of peace industries was proper and necessary and that the automobile industry thoroughly co-operated in a most commendable manner with the War Industries Board is the text of an outline of the activities of the Automotive Products Section by C. C. Hanch, Chief of the section.

The outline, made public to-day, states among other things that during the last 6 months of 1918, when reduction of passenger cars was limited to 50 per cent of 1917, manufacturers requested permits for production of 295,468 cars, which was allowed. Of these, 186,178 cars were produced during the third quarter, leaving 109,290 to be produced during the last half of the year.

This total of 295,468 cars is approximately 50 per cent of the production during the same period of 1917, not counting Fords. The Ford company made no request for permission to manufacture passenger cars in the last half of 1918.

That the automobile industry "was most valuable to the war machine and took on military works exclusively of motor trucks to the extent of $1,000,000,000," is a statement in Mr. Hanch's report. "The industry has been of incalculable aid to the successful prosecution of the war," testifies Mr. Hanch.

Control of the industry by the War Industries Board and its curtailment insofar as passenger car manufacture is concerned was found, according to the statement, to be "necessary due to the drafting of millions of men and the resulting shortage of labor, transportation, fuel, etc.," which made it "obvious that non-war industries could not reasonably expect to continue normal activities." Following is the complete account of the activities of the Automotive Products Section during the war and up to the time of the cessation of its activities as told by Mr. Hanch:

Work of the Automotive Products Section

By C. C. Hanch

Chief Automotive Products Section

THE Automotive Transport Committee, a co-operative committee of the Advisory Commission of the Council of National Defense, was organized June 4, 1917. The committee was created as a channel of communication between the automotive industries and the governmental departments and continued under the same jurisdiction until September 4, 1917, at which time the committee was reorganized and placed under the War Industries Board, and was thereafter known as the Automotive Products Section.

At the time the Automotive Transport Committee was organized Charles Clifton was made chairman. K. W. Zimmerschied served as vice-president from June 4, 1917, to September 4, 1917. H. L. Horning served as Chief of the Automotive Products Section from September 4, 1917, to June 19, 1918, and C. C. Hanch served as Chief from June 20, 1918, until the Section disbanded. The final form of organization of the Section is indicated in the chart.

The first report of the Automotive Transport Committee is contained in the first annual report of the Council of National Defense at page 89. Report for the fiscal year June 30, 1917, to June 30, 1918, is contained in the second annual report of the Council of National Defense.

Composition of Committee

The Committee or Section as originally constituted consisted entirely of representatives of the automotive industry. When the committee was reorganized in September, 1917, an army representative and a member of the War Industries Board were added. After the functions of the War Industries Board were defined by the President's letter of March 4, 1918, the form of organization of the Automotive Products Section was further modified so that it consisted entirely of representatives of six Governmental departments presided over by the Chief and assisted by the staff of the Section.

Regular meetings of the Section were held monthly and conferences were held with the different Section representatives at frequent intervals. The procedure of the Section in performing its functions was determined at the regular meetings. Automotive subjects generally were discussed and particular attention was given to such matters as clearances, interferences, facilities and allocations.

Jurisdiction of Products Section

The Automotive Products Section had jurisdiction over the following line of automotive material on the clearance list of the War Industries Board (which list and the regulations thereunder governed the purchasing departments of the Government in the procurement of these commodities), including combustion engines and their application, their accessories, parts, etc., with the exception of agricultural tractors and stationary and portable engines for agricultural and other purposes:

Bicycles	Armored cars
Motorcycles,	Military tractors
Motorcycle side cars	Military tanks
Motor cars	Airplane engines
Motor ambulances	Airplanes
Motor trucks	Marine gas engines
Motor truck bodies	Automotive accessories and parts
Motor truck tractors	
Motor truck trailers	

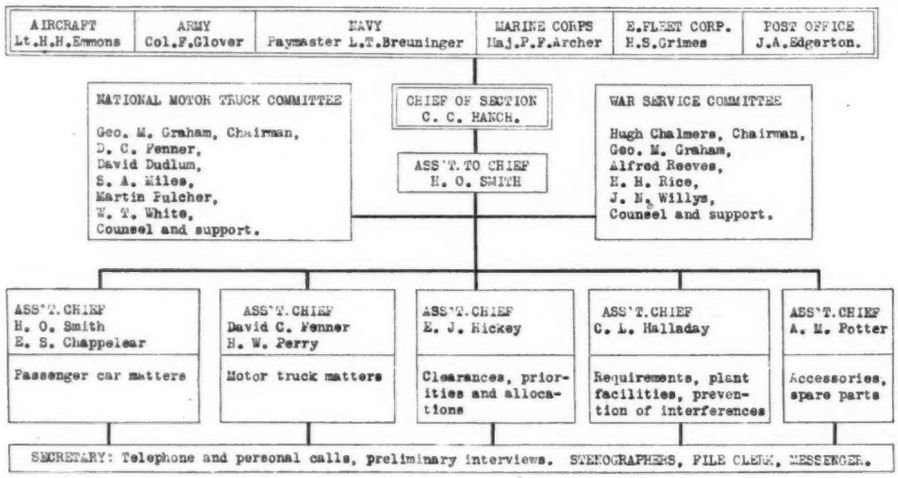
Purchases of automotive equipment or materials covered by the above list which the Allied Governments desired to make in the United States through the Allied Purchasing Commission were sent to the Automotive Products Section for recommendation before purchases were made.

Advised With Priorities Division

The Automotive Products Section advised and made recommendations to the Priorities Division in reference to individual applications for priority certificates filed by subcontractors on United States and Allied Government purchases of automotive equipment and materials, and also gave advice in reference to applications filed by others for materials for commercial purposes.

Among other functions of the Section actually being performed at the close of the war were the following: Granting clearances on purchases of automotive equipment by the various departments of the United States Government and the Allies. Recommendation of sources of supply where there was a shortage of facilities and the allocation of orders where there was interference or shortage of capacity. Personal contact was constantly maintained by a member of the Section staff with all Governmental departments represented on the Section, thereby providing intimate knowledge of all requirements and facilities for their execution. Help was extended the Governmental agencies in classifying requirements and the conversion or arrangement of same to meet existing facilities where possible. This called for a close study of and a calculation of aggregate facilities. These reports were placed in the hands of departments concerned and were of assistance in the final balancing of requirements and facilities. Co-operation with the various procurement divisions was maintained and lists of possible sources of supply were edited or compiled and additional sources suggested when needed. Request for increased facilities for war purposes were examined and recommendations submitted. Applications for stock and bond sales, increases in capitalization and creation of new companies referred to the Section by the representative of the Capital Issues Committee were examined and recommendations submitted. Engineering and production problems as relating to alternate selection of

Chart of Organization of the Automotive Products Section



materials or ways and means, were solved informally with Governmental departments which represented them. Suggestions were made to automotive manufacturers as to how their facilities could best be used and their representatives were given introductions to the proper officials negotiating the work.

The most interesting and difficult problems were encountered by the Section in connection with the administration of the regulatory arrangements made between the War Industries Board and the automotive industries such as passenger automobiles, motor trucks, bicycles, motorcycles, ball and roller bearings.

The automobile and motor truck industry was in a remarkably active condition at the beginning of and during the first half of 1918. During the calendar year 1917 there were produced 1,740,792 passenger automobiles and 128,157 motor trucks, the aggregate sales value of which at wholesale prices amounted to $1,238 979,891. There were approximately 300,000 men employed by the automobile and motor truck manufacturers and 320,000 men employed by the accessory and component parts makers in 1917. High grade steel and other metals were being consumed by the automobile and motor truck industry at the rate of 2,000,000 tons per annum. Shortage of material and labor had began to be felt in the fall of 1917 and were becoming acute during the first half of 1918. With millions of men being drafted, or enlisted, and taken from the ranks of productive labor with the resulting shortage of labor, transportation, fuel, etc., it was obvious that non-war industries could not reasonably expect to continue normal activities. Under these circumstances if the automotive industry had attempted to operate with continued normal activity on civilian business it would have either hampered itself and other industries or the Government in the prosecution of the war.

Production Reduced 30 Per Cent

Early in March, 1918, representatives of the automobile industry were called into conference by the War Industries Board and after full discussion it was agreed that a 30% reduction in the current manufacturing schedules of passenger car makers would not cause disturbance in the automobile industry and would help solve the problems of transportation and raw materials.

Upon request the manufacturers proceeded with this reduction, effective March 1, 1918, and continuing up to the end of the fiscal year, ending June 30, 1918, and not later than July 31, 1918.

Representatives of the motor truck industry made an interesting and forceful presentation of the important needs of their industry with the result that early in August, 1918, the War Industries Board reached the decision that "motor trucks, insofar as they are used directly or indirectly for war purposes, are war essentials and their production for such purpose must be facilitated, and further, insofar as motor trucks are employed in civilian industries for essential uses, they constitute an important transportation medium and any curtailment of such uses should be avoided as far as practicable." The Board further defined its attitude in a special Circular No. 11 addressed to manufacturers of motor trucks in which the Priorities Commissioner stated that "it appears, however, that there exist in this industry, as in many others, factors of non-essentiality which must, as a war measure, be removed." As a practical means of eliminating this degree of non-essentiality, a pledge was framed by the War Industries Board to be given by all truck manufacturers and their distributers and dealers before any preference could be accorded them in procuring materials.

Issues "Industry Priority Certificate"

Instead of issuing individual priority certificates to motor truck manufacturers for each purchase of parts and materials the Automotive Products Section recommended that an "Industry Priority Certificate" be issued to each manufacturer under which the manufacturer could order his materials in the usual way by attaching the prescribed form of affidavit to his purchase orders. This plan facilitated the procurement of materials by the manufacturers and avoided an enormous amount of clerical work by the War Industries Board and the manufacturers.

The pledge bound the manufacturers and dealers, among other things, to sell no motor trucks except for essential uses, to sell no user an unnecessary number of trucks even for essential uses, to discourage the purchase of any motor truck to replace a usable truck already in service, to give maximum encouragement to the repair of trucks, and to make monthly reports to the Automotive Products Section. It was expected that the effect of this pledge would be to reduce the output of trucks to some extent, not because the transportation facilities and economies afforded by motor trucks were considered unimportant or undesirable, but solely because of the shortage of labor, steel and other materials entering into the construction and use of trucks.

To conserve iron and steel without working undue hardships on some truck manufacturers as compared with others, the supply of these materials was allocated among all on the basis of past production of trucks by each company during a normal production period. Industry Priority Certificates issued to the manufacturers permitted them to proceed during the last half of 1918 at the average rate during the period of the 18 months ending June 30, 1918. Greatly expanded production schedules of some of the newer companies were necessarily curtailed as a war measure and new enterprises involving the use of material, labor and capital were discouraged as unnecessary for the reason that existing facilities were ample to produce all motor trucks required for essential uses or for which steel could properly be furnished. There was no restriction whatever on the production of trucks for military purposes—on the contrary, every effort was made to expedite the manufacture of trucks ordered by the United States Government and the Allies.

The manufacturers of passenger automobiles were again called into conference by the War Industries Board in pursuance of the curtailment agreement made in March, 1918, and after full consideration of all phases of the situation a further understanding was reached between the automobile industry and the War Industries Board which was expressed in a letter written Aug. 24, 1918, by the War Industries Board to the National Automobile Chamber of Commerce. It appeared that the stocks of raw materials and semi-finished goods in the hands of the manufacturers of passenger automobiles were large and greatly unbalanced and that they could not be liquidated until they had been matched up with other materials necessary to manufacture the completed cars.

Assists in Liquidation of Stock on Hand

It was becoming obvious that under the priority preference being given to the production of direct and indirect war needs, the withdrawal by the Government of labor from establishments then producing materials for the Government and the automobile industry and the increasing difficulties of securing transportation and fuel, manufacturers of passenger automobiles would have been unable on their own account to secure materials to match up their unbalanced inventories and continue production upon a basis which would support their organizations.

Under these circumstances the conclusion was reached that it was in the public interest as well as in the interest of the automobile industry that it be assisted as far as practicable without interfering with the war program in the liquidation of its stocks then on hand. To that end it was decided to accord a degree of preference to each manufacturer of passenger automobiles who would subscribe to a pledge, the essence of which was as follows: "That its production of passenger automobiles and all repair parts therefor, shall not, for the six months ending with Dec. 31, 1918, exceed 25 per cent of its production for the calendar year 1917." This pledge meant that passenger automobile manufacturers were permitted to operate on a 50 per cent basis during the last six months of 1918, as compared with the year 1917. It was believed that this basis

would support the organizations of the manufacturers until they could utilize their facilities as far as practicable for the production of direct and indirect war requirements which they were urged to do. The attention of the manufacturers was called to the urgent war requirements for iron and steel and the uncertainty of being able to procure materials for the manufacture of passenger automobiles after Jan. 1, 1919, if the war continued.

The administration of the arrangement made with passenger automobile manufacturers was assigned to the Automotive Products Section, which developed the following procedure:

Procedure of the Section

A. Submission by the manufacturers of sworn inventory figures approximately as of July 1, 1918, showing value of material on hand and value of material required to balance the inventory, also tonnage of principal classes of steel and the number of principal assembled units on hand and tonnage of principal classes of steel and number of principal assembled units required to balance up the material on hand.

B. A statement of the number of finished cars which could be built from the inventory when balanced and the time required to complete them.

C. Submision of sworn production figures separately for the years 1916, 1917 and the first half of 1918.

Upon receipt of the foregoing information the Automotive Products Section certified to the Director of Steel Supply the requirements of each manufacturer for the principal classes of steel in tons and principal assembled units to balance up inventory on hand and produce the passenger automobiles allotted under the manufacturer's pledge. Each manufacturer was then notified that he was privileged to build a specified number of cars and that materials therefor might be obtained by filing in triplicate with the Director of Steel Supply applications for "Permit to Purchase." The manufacturer's copy of application for "Permit to Purchase" when granted constituted the necessary authority for the supplier to fill the manufacturer's order.

In case the supplier or parts manufacturer was not the original source of supply of the raw materials required, such supplier or parts manufacturer made application for "Permit to Purchase" in like manner and on the same form as required from the maker of passenger automobiles. Materials required for the manufacture of essential repair parts both by the makers of passenger automobiles and by their suppliers were obtained on "Permits to Purchase" when endorsed by the Automotive Products Section and approved by the Director of Steel Supply.

Certified Manufacturers' Requirements

Under this procedure the Automotive Products Section certified to the Steel Division the requirements of 95 manufacturers covering the production of 295,468 passenger cars during the last half of 1918.

The application for "Permit to Purchase" carried an undefined degree of preference, which was sufficiently flexible to meet the needs of the manufacturers and the routine was simpler and more rapid in its results than under the usual procedure of application for individual priority certificates. The equitable control of the industry, under the arrangements made with it, was accomplished by monthly reports of operation submitted by the manufacturers carrying the following information:

1. Number of finished cars on hand at beginning of month.
2. Number of cars produced during the month.
3. Number of cars delivered to United States Government during month.
4. Number of cars delivered to Allied Governments during month.
5. Number of cars delivered for civilian use during month.

Of the total productive allotment of 295,468 cars for six months as certified to the Director of Steel Supply by the Automotive Products Section, 186,178 cars were produced during the third quarter, leaving 109,290 cars to be produced during the last quarter of the year.

On Nov. 11, 1918, the date when the armistice was signed, a circular was issued which removed 50 per cent of the restrictions which had been imposed on the production of passenger automobiles.

Material requirements for parts and accessories were handled by the section through "Permits to Purchase," and this arrangement made it possible to obtain materials to keep in operation the passenger cars in use. No definite ruling was made as to what allowance of material could be made to manufacturers of automobile repair parts, replacement parts or accessories. In the absence of any such ruling the manufacturers were advised to make application for "Permit to Purchase" and each application was considered on its merits and either approved for the quantity of material which conditions warranted and sent to the Director of Steel Supply, or disapproved.

Permits Governed by Production

The quantity of material allowed under applications for "Permit to Purchase" was in most instances governed by the applicant's previous output of production. The section usually recommended that the applicant be permitted to purchase sufficient materials to carry him through a period of from 60 to 90 days at a production rate of about 50 per cent of normal.

In cases where the article which the applicant desired to produce was of such a character as to be unnecessary for repair, maintenance or upkeep of existing automotive equipment and in cases where the applicant had sufficient material on hand to meet his requirements for a considerable period on a conservative production basis, the application was disapproved. Disapproval was also given applications for permit to purchase where the material desired was for the purpose of producing new or untried devices or alleged improvements which were not supported by reliable endorsement. In all cases the replacement of entire assemblies where the simple repair, replacement or readjustment of an individual part would serve to restore the machine to normal running condition was vigorously discouraged.

In short, all necessary steps were taken to convert the automotive industry from peace time activities to the most effective condition and efficient form of organization for the prosecution of the war and prompt reconversion after the end of hostilities. Too much credit cannot be given the automotive industry for the effective and patriotic work it has done in the war emergency.

275,000 Vehicles for Allies

Before the United States entered the war American truck manufacturers had furnished more than 40,000 motor trucks to England, France and Russia. After entering the war and prior to the signing of the armistice, motor truck and passenger car manufacturers had contracted to furnish the American army and navy about 35,000 passenger cars and 200,000 trucks and ambulances. About half of this number had been completed when the armistice was signed, of which 54,343 trucks had been floated for use of the American Expeditionary Forces. About 15,000 trucks were in use by the military establishment in the United States. More than 30 manufacturers supplied trucks to the military establishment. In response to the needs of the Government many manufacturers gave up all or most of their civilian trade in order to furnish trucks and automotive equipment to the army and navy.

The motor vehicle industry supplied the engineering talent, mechanical genius and facilities to carry through the greater part of the airplane program. Automobile companies had accepted orders for about 70,000 Liberty airplane engines before the war ended and at that time the production of engines had reached a rate of several thousand per month.

In this connection it should not be assumed that automobile and motor truck manufacturers confined themselves to the production of automotive equipment. Among other articles manufactured by passenger car and truck makers, in addition to passenger cars, motor trucks, airplane engines and parts, were the following:

Military Production of the Industry

Eagle submarine chasers	Artillery wheels
Tractors	Litters
Kitchen and other trailers	75 mm. and 155 mm. shells
Ambulance bodies	Depth bombs
Tanks	Airplane bombs
Gun carriages	Mine anchors
Gun recoil mechanisms	Grenades
Naval gun mounts	Shell adapters
Escort wagons	Torpedo directors
Water carts	Balloon winches
	And many other articles.

The highly trained mechanical knowledge and skill of the automotive industry was most valuable to the war machine, and the great capacity and modern machinery of the automobile plants fitted them better than most industries to execute the varying requirements of modern warfare. The automotive industry, including passenger car makers, took on military work exclusive of motor trucks to the extent of approximately $1,000,000,000.

It is highly to the credit of the men in the industry that those orders were taken at prices that afforded a relatively small percentage of profit with the object of rendering patriotic service to the country. Without exception, motor truck and passenger car manufacturers have exhibited a willing spirit of co-operaton with the War Industries Board in taking on war work, accepting its decisions affecting production of civilian trucks and passenger cars and in faithfully observing the pledges given regarding the use of materials and the restrictions of sales to essential uses.

As a whole, the industry has been of incalculable aid to the successful prosecution of the war.

—

Clark Equipment in Movies at Shows

BUCHANAN, Mich., Jan. 25—The Clark Equipment Co. is showing at the Chicago and New York automobile and truck shows a series of industrial films portraying the actual processes of manufacture in its plants. The films are being shown at the Hotel LaSalle in Chicago and the Waldorf-Astoria in New York as supplementary exhibits to the disc wheels and axles displayed at the regular shows. Complimentary tickets of admission will be mailed on application to the company, or may be obtained at the booth at the shows.

—

Indian Service Wants Car

WASHINGTON, Jan. 25—The United States Indian Service, Department of the Interior, asks for bids on one light weight 5-passenger touring car from manufacturers or regular dealers. Cut and description of car, equipment and date of delivery, together with delivery point, are to be submitted with the bid, which should be made to the United States Indian Ware House, 308 South Green Street, any time up to 10 a. m. Jan. 30.

—

Tractors Needed in Greece

WASHINGTON, Jan. 25—Greece is suffering from a shortage of agricultural machinery and particularly tractors. The government has just placed an order with an American company for 15 motor plows and 200 tractors fully equipped with plow, harrow, hoe and thresher. Greece is cultivating more than 1,300,000 hectares (1 hectare equals 2.47 acres) of land, and has at its disposal only 160 thrashers, 1,200 reapers, 100,000 plows and no tractors.

—

Motorine, Gasoline Substitute in Greece

WASHINGTON, Jan. 25—Due to a shortage of petroleum in Greecce, a substitute called "motorine" has been produced, which comprises spirits of turpentine twice refined, or a mixture of alcohol and turpentine in proportions of 85 to 15. It has been very successfully used in Diesel petroleum engines.

—

Weather Bureau Helps Keep Roads Open

WASHINGTON, Jan. 27—Help given last winter by the Weather Bureau in keeping the Lincoln Highway open between Harrisburg and Pittsburgh, during the season of heavy snows, is being arranged this year for portions of New York and New Jersey.

The Bureau has called the attention of

Calendar

ENGINEERING

S. A. E. Meetings

Jan. 30 — Chicago—"Home-coming" Supper, Morrison Hotel.

Feb. 3—New York—Banquet in honor of Capt. E. V. Rickenbacker, Waldorf-Astoria, Contest Board, American Automobile Association.

Feb. 4-6 — New York. Winter Meeting. Society of Automotive Engineers, Engineering Societies' Building.

Feb. 5—Minneapolis Section, S. A. E. — Hotel Radisson. "Radiator Cooling Fans."

Feb. 6—Victory Dinner, Hotel Astor, New York.

March 5 — Minneapolis Section, S. A. E.—Hotel Radisson. "Tractor Service and Sales."

April 2—Minneapolis Section, S. A. E. — Hotel Radisson. "Implements Designed for Tractor Belt Power and Their Characteristics."

MOTOR SHOWS

Jan. 25-Feb. 1 — Chicago. Passenger cars, Coliseum.

Feb. 1-15—New York. Automobile Dealers' Assn. Charles A. Stewart, Manager, Hotel Woodward, Broadway and 55th St.

Feb. 4-7 — Fargo, N. D. Fargo and Moorhead Automotive Trade Assn.

Feb. 5 - 6 — Chicago. Trucks, Coliseum.

Feb. 6-15—San Francisco, Cal. Third Annual Pacific Automobile Show, Motor Car Dealers' Assn. of San Francisco, Exposition Auditorium. G. A. Wahlgreen, Manager.

Feb. 10 - 15 — Rochester, N. Y. Rochester Automobile Trades Assn., Exposition Park. George C. Donahue, Manager.

Feb. 12-15—Defiance, O. Second Annual Show under auspices of Defiance Automobile Dealers' Assn.

Feb. 15-22—Newark, N. J. N. J. Auto Exhibition Co. Calude Holgate, Manager.

Feb. 15-22 — Cleveland, Ohio. Cleveland Auto Show Co. Fred H. Caley, Manager.

Feb. 15-22—Minneapolis, Minn. Minneapolis Auto Trade Assn. Walter B. Wilmot, Manager.

Feb. 15-22—Albany, N. Y., Albany Automobile Dealers' Assn. State Armory.

Feb. 17-22—St. Louis. St. Louis Auto Mnfrs. & Dealers' Assn. Robert E. Lee, Manager.

Feb. 17 - 22 — Louisville, Ky. Louisville Auto Dealers' Assn.

Feb. 17-22—Des Moines, Iowa. Tenth Annual, Des Moines Automobile Dealers' Assn. C. G. Van Vliet, Manager.

Feb. 17-22 — Pittsfield, Mass. Pittsfield Automobile Dealers' Assn., State Armory. James J. Callahan, Manager.

Feb. 17-22 — Passenger Cars; Feb. 24-27, Trucks—South Bethlehem, Pa. Lehigh Valley Auto Shows Co. J. L. Elliott, Manager.

Feb. 17-22—Grand Rapids, Mich. Grand Rapids Automobile Business Assn. E. T. Conlon, Manager.

Feb. 18-22—Baltimore, Md. Baltimore Automobile Dealers' Assn. and Automobile Club of Maryland, Fifth Regiment Armory. H. M. Lucius, General Manager.

Feb. 18-22 — Oklahoma City, Okla. Automotive Show. R. H. Haun, Manager.

Feb. 22-Mar. 1—Hartford, Conn. Hartford Automobile Dealers' Assn., Inc., Broad Street Armory. Ben. F. Smith, Manager.

Feb. 22-Mar. 1—Atlantic City, N. J. Auto Trades Assn. of Atlantic City.

Feb. 23-March 1—Cedar Rapids. Auditorium. Automobile Dealers' Assn.

Feb. 24-Mar. 1—Burlington, Ia. Second Annual.

Feb. 24-March 1—Kansas City, Mo.—Kansas City Motor Dealers' Assn. E. E. Peake, Manager.

Feb. 24-Mar. 1 — Springfield, Mass. Automobile Dealers' Assn. Harry W. Stacy, Manager.

Feb. 24-Mar. 1—Portland, Ore. Ninth Annual Dealers' Motor Car Assn., Automobile Palace. M. O. Wilkins, Manager.

Feb. 26-Mar. 1—Mason City, Ia. Fifth Annual, Mason City Auto Show Assn.

Feb. 26-Mar. 1—Madison, Wis. Seventh Annual, Automobile Dealers' Division of Madison Assn. of Commerce. Union Transfer Bldg.

Feb. — Wheeling, W. Va. Automobile show at Market Auditorium.

March 1-15—New York Aeronautical Exhibition, Manufacturers' Aircraft Assn., Madison Square Garden and 69th Regiment Armory.

March — Scranton, Pa. Thirteenth Regiment Armory, Scranton Automobile Assn.

March—Utica, N. Y. Utica Motor Dealers' Assn. W. W. Garabrandt, Manager.

March—Philadelphia, Pa. Philadelphia Automobile Trade Assn. Passenger cars.

March 1-8—Detroit, Mich. Detroit Automobile Dealers' Assn. H. H. Shuart, Manager.

March 3-8—Columbus, O. Columbus Automobile Show Co., Memorial Building. W. W. Freeman, Manager.

Mar. 3-8 — Muskegon, Mich. Third Annual, Armory, Muskegon Lodge No. 274, B. P. O. E. John C. Fowler and George M. Friant, Managers.

Mar. 3-8—Scranton, Pa. Ninth Annual, 13th Regiment Armory, Scranton Automobile Assn. Hugh B. Andrews, Manager.

March 3-8—Buffalo, N. Y. Buffalo Automobile Dealers' Assn.

March 5-8—Quincy, Ill. Quincy Automobile Trades Assn., Armory.

Mar. 8-15 — New Brunswick, N. J. Armory, New Brunswick Motor Trade Assn. William Kuehle, Manager.

March 10-15—Paterson, N. J. Paterson Automobile Trade Assn., Fifth Regiment Armory. H. MacGinley, Show Manager.

March 10-15—Syracuse, N. Y. Syracuse Automobile Dealers' Assn. Harry T. Gardner, Manager.

March 10-15 — Omaha, Neb. Fourteenth Annual, Omaha Automobile Trade Assn., Auditorium. Clark G. Powell, Manager.

March 12-19—St. Joseph, Mo. Sixth Annual. St. Joseph Automobile Dealers' Assn.

March 15-22 — Boston, Mass. Boston Automobile Dealers' Assn. Chester I. Campbell, Manager.

March 15-22—Harrisburg, Pa. Harrisburg Motor Dealers' Assn., Overland Warehouse. J. Clyde Myton, Manager.

March 17-22 — Great Falls, Mont.—Montana Automobile Distributors' Assn.

March 19-22—Norfolk, Neb. Norfolk Automobile Show Assn.

March 22-29—Pittsburgh Automobile Dealers' Assn. of Pittsburgh. John J. Bell, Manager.

March 22-29, Passenger Cars; April 1-5, Trucks—Brooklyn. Brooklyn Motor Vehicle Dealers' Assn. I. C. Kirkham, Manager.

Mar. 26-29—Watertown, N. Y. Tenth Annual, State Armory, Automobile Dealers' Assn. Arthur E. Sherwood, Manager.

Third week March — J. Trenton Automotion, N. Assn. John L. Bridge Manager.

April 5-12—Montreal, Can.—National Motor Show of Eastern Canada, Victoria Rink. T. C. Kirby, Manager.

Not decided—Bridgeport, Conn. Auspices of City Battalion. B. B. Stelber, Manager.

Not decided—Indianapolis, Ind. Indianapolis Auto Trade Assn. John B. Orman, Manager.

June 2-6—Hot Springs, Va. Convention, Automotive Equipment Assn., Homestead Hotel.

TRACTOR SHOWS

Feb. 15-22—Minneapolis, Minn.

Feb. 18-22—Wichita, Kan. Annual Mid-west Tractor and Thresher Show. Wichita Tractor and Thresher Club. Forum.

Feb. 24-March 1—Kansas City, Mo. Fourth Annual Tractor Show. Sweeney Building, Kansas City Tractor Club. Guy H. Hall, Sec.

CONVENTIONS

Feb. 4-6—New York. Meeting Society Automotive Engineers.

Feb. 19—New York, 13th annual banquet of Aero Club of America, Waldorf-Astoria.

Feb. 25-28—New York. Sixteenth Annual Convention. American Road Builders' Assn.

Feb. 25-28 — Ninth American Good Roads Congress and 16th Annual Convention of the American Road Builders' Assn. Hotel McAlpin, New York.

April 24-26—Chicago — National Foreign Trade Council, Sixth National Foreign Trade Convention. Congress Hotel.

---

its officials in charge of stations to the service they may give the public by co-operation with state highway commissions, automobile associations and others in keeping open main highways, especially those used for rural express, motor truck and parcel-post routes.

The work in the winter of 1917-18 was in co-operation with the Pennsylvania State Highway Commission. Reports of the amount and condition of snow were made by the assistant superintendents of highways at points along the Lincoln Highway to the Weather Bureau office at Pittsburgh, which bulletined the reports to the press, automobile clubs and motor truck associations.

The official in charge at Pittsburgh also issued warnings of heavy snows for the mountain regions of western Pennsylvania, based on the State forecasts. These were furnished to the press and telegraphed to the State Superintendent of Highways, who gave instructions to his assistants for keeping the routes open.

Increase Gas Shipments to Argentine

WASHINGTON, Jan. 27—The serious shortage of gasoline in Argentine, which, during the war and up to the present time, considerably decreased the use of motor vehicles in that country, will soon be alleviated. The shortage of gasoline was created by the scarcity of shipping space. This matter has been brought to the attention of the shipping officials by the Ambassador from Argentine, and, according to a report from him, steps are being taken so that gasoline shipments to South America will soon be considerably increased.

Foreign Trade Opportunities

WASHINGTON, Jan. 27—The Bureau of Foreign and Domestic Commerce, Department of Commerce, has inquiries for the agencies of automobiles and tractors. Full information regarding each of the following can be secured by addressing the Bureau of Foreign and Domestic Commerce and referring to the foreign trade opportunity number.

A man in France desires to purchase or secure an agency for the sale of low priced automobiles. Terms, thirty to ninety days for large accounts, ordinarily cash. Correspondence in English. References have been filed. Foreign Trade Opportunity No. 28169.

An agency is desired by a man in Switzerland for the sale of tires. Correspondence may be in English. References have been filed. No. 28182.